

REVIEW OF COAL SUPPLIES AND REQUIREMENTS IN WESTERN EUROPEAN AND SOVIET BLOC COUNTRIES, 1955 AND 1956

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CONTENTS

	<u>Page</u>
Introduction	1
Present and future fuels and energy position in Europe	2
Summaries of energy requirements and capabilities of individual free European countries	7
Austria	7
Benelux countries	9
Belgium	9
The Netherlands	10
Luxembourg	11
France	11
Germany (West)	14
Greece	15
Ireland (Eire)	16
Italy	17
Portugal	18
Saar	19
Scandinavian area	20
Denmark and Finland	20
Norway and Sweden	21
Spain	22
Switzerland	24
United Kingdom	24
Yugoslavia	26

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Information Circular 7778

CONTENTS (Con.)

	<u>Page</u>
Description of coal supply and requirements in the Soviet Bloc countries	27
Albania	27
Bulgaria	28
Czechoslovakia	29
Germany (East)	30
Hungary	30
Poland	32
Rumania	34
Soviet Union	34
Statistical annex	36
Table 1. - Recoverable coal reserves of selected countries, Europe	36
Table 2. - Coal production in selected countries, Europe, 1950, 1955, and 9 months in 1956	37
Table 3. - Productivity in the European coal-mining industries of selected countries, overall output per man-shift	37
Table 4. - Coal imports by selected European countries, 1955	38
Table 5. - Imports of solid fuels by type and country of origin, Italy, 1955	39
Table 6. - United States bituminous-coal and anthracite exports to Europe, by countries of destination, 1938, 1947, 1950-55, and January-September 1956	40
Table 7. - Coal (anthracite and bituminous) supply, availability, and consumption in Western European countries, 1955	41
Table 8. - Lignite (brown-coal) supply, availability, and consumption in Western European countries, 1955	42
Table 9. - Trend of coal prices in principal European Coal and Steel Community countries, for selected months, 1952-56	43
Table 10. - Consumption of primary energy, excluding bunker fuel, in OEEC countries, 1955	44

INTRODUCTION

The purpose of this review is to provide an analysis of the supply and demand for coal in Europe in 1955-56 and estimates of future growth in European requirements as a medium for appraisal of the effects and benefits to the economy of the United States. This review stems from observations and evaluations made in contacts with Government and industry representatives of the principal countries of Europe and is based on detailed data selected from the established flow of unclassified economic and statistical material originating in overseas areas for use and deposit in the Bureau of Mines, Foreign Solid Fuels Section. This material includes current reports and analyses prepared by the United States Foreign Service, official reports of individual countries, foreign industry and trade publications, and the committees of the several European organizations engaged in continuing review and study of problems relating to fuels and energy.

The review is presented in four sections:

1. Discussion of the more important factors relating to the present and future fuels and energy position of Western Europe.
2. Summary of the energy requirements, coal-production capability and degree of dependence on imports in individual Western European countries.
3. Brief description of the coal supply and requirement situation in countries of the Soviet Bloc.
4. Statistical annex.

No attempt was made at detailed evaluation of all aspects of the fuels and energy position of the entire area treated in this review because of time and space limitations. It is believed, however, that the information presented will prove useful to the coal industry of the United States and others interested in the foreign coal trade.

The difficulties in obtaining reliable specific data on coal production, reserves, and distribution in the smaller Eastern European Soviet Bloc countries are well known. Such data as are available usually stem from estimates, while a studied, detailed survey of all available literature on the subject, and the inferences or estimates that may be drawn, present too broad a field to cover in the brief time allotted to the preparation of this report. It is expected, therefore, that some deficiencies may become evident, but it is believed that the presentation included here will prove useful and interesting. A complete survey of the coal industries of the countries was by no means intended. Nevertheless, these notes may serve to bring together production data and other more recent information not generally available in any single published source.

For the benefit of readers who may be interested in detailed statistics, the final section of this review provides data on European coal reserves, prices, production, productivity, foreign trade, availability, and consumption.

PRESENT AND FUTURE FUELS AND ENERGY POSITION IN EUROPE

The consensus of opinion of competent authorities is that a progressive rise in the demand for energy in Europe and elsewhere will continue. According to conservative estimates by leading fuel specialists, world energy demand may increase over 50 percent in the next 20 years. The development of all available sources of energy will be necessary to meet this rapidly growing demand. As regards Western Europe, the prospect of future energy consumption being supplied by indigenous coal production is unfavorable, judging by 1955-56 requirements. Because of geological, technical, and economic limitations that preclude such flexibility as exists in the United States, the European coal-mining industry faces constant handicaps in its effort to meet the accelerated demand for greater coal output. Despite strenuous efforts by the industry to raise production, output will not be adequate to pace growing requirements.

The greater proportion of coal produced in Europe is from seams generally 3 to 4 feet thick; many of them are steeply inclined and occur at depths of 1,000 to 5,000 feet below the surface. By way of comparison, the average depth of bituminous-coal seams under exploitation in the United States is about 190 feet, they average about 5 feet in thickness, and are generally horizontal. Moreover, approximately 25 percent of the annual coal output in the United States is extracted from strip (open-pit) mines. Aside from the difficult mining conditions in Europe, the general shortage of manpower is a continuing deterrent to greater production. The mine-labor shortage in Europe is a corollary of the general state of full industrial employment and the availability of more attractive occupations.

In 1955 the United Kingdom's coal output (225 million metric tons) was about 2.5 million tons below that in 1954 and was attributed to manpower shortage, unofficial labor stoppages, and a large number of underground workers engaged in development work in new mining projects under the National Coal Board's long-range plan for rehabilitating the industry. The 1956 coal output in the United Kingdom promises some improvement over that of the preceding year because of more working days with fewer labor stoppages and holidays. The first 44 weeks indicated an increase of about 300,000 metric tons. In France, declines in production are expected in 1956 as a result of acute mine-labor shortages developed earlier in the year owing largely to the outbreak of hostilities in North Africa, which required the induction of reservists, many of them from the coal-mining districts, to strengthen the military forces. In September a Government decree was issued providing for release of coal miners from the military service to relieve the current mine-labor problem. This action should materially aid efforts for improved output.

Belgium and the Netherlands cannot be expected to extend their production capabilities much beyond the present rates; nevertheless, sizable new long-range mining-development programs are in progress. Improvement programs for new development are directed primarily to supplement existing workings and to maintain the present output rather than to enlarge the total production capacity. The Saar area, which is expected soon to be integrated in the West German economy, is not likely to raise production significantly.

Of the principal coal-producing areas in Europe, West Germany appears to be the only country where a continued increase in output may be expected, although here

again the industry is beset with labor shortages and difficult mining conditions. Despite an inadequate labor force the 1955 production in West Germany was 131 million metric tons, or about 3 percent higher than in the previous year. In the first 8 months of 1956 output was about 3 million tons above the same period in 1955.

The total coal production in Western Europe in 1955 amounted to about 480 million metric tons. Preliminary production data for the first 8 months of 1956 show favorable increases that may bring this year's output to approximately 485 million tons. According to current plans and trends, production in 1975 is expected to reach 520 million tons, which means that new capacity must be developed for an additional 35 million tons annual production.

Faced with perennial coal shortages in home supply, Western Europe will be compelled to continue to import coal in volume. The greatest coal shortages are in the coking, metallurgical, and gas coals, although there are also shortages of good indigenous steam grades. The most critical shortage is that of the coking coal required for Europe's expanding steel industry. West Germany, Europe's major indigenous source of coking coal, supplies over half of the coking-coal output of the ECSC countries. The only source where surplus coals of all grades and qualities are available is the United States, which also has adequate transportation and port facilities for large-volume deliveries to overseas areas. The only other sources for limited import coal supplies are Poland and the U.S.S.R., but these countries are also confronted with internal fuel shortages, so that exports to Western Europe are restricted mostly to the fulfillment of commodity trade-agreement requirements. Little, if any, coking coal is available from these sources, and such exports as are involved in the trade with the West consist of steam coal from Poland and anthracite from the U.S.S.R.

The principal problems relating to Europe's coal supply and energy demand were discussed at length in a recent report of the Energy Commission of the Organization for European Economic Cooperation (OEEC).^{5/} The main conclusions of the report point up the necessity for extensive investment in coal-mining development and other conventional sources of energy in Europe, if large expenditures for imported fuels are to be held to a minimum in the next twenty years. Moreover, the report indicated that nuclear energy is unlikely to provide over 8 percent of the total energy demand in Western Europe in 1975.

The Commission estimates that, in the absence of any major economic disturbances, the demand for energy in Europe will likely reach the equivalent^{6/} of 840 million metric tons of bituminous coal and anthracite in 1960 and about 1,200 million tons in 1975, as compared to 730 million tons in 1955. In the next 20 years, the gap between indigenous supplies and total demand will continue to grow to the extent that by 1975, on the basis of 1955 prices, Western Europe's expenditures for imported coal and oil will exceed \$5 billion annually. It is estimated that, by 1975, the contribution of nuclear sources to total energy needs will amount to only about 80 million tons in coal equivalent, or about 8 percent of total fuel requirements.

The following table shows the estimated contributions to the total production of primary energy, excluding nuclear sources, in million metric tons of coal equivalent, from indigenous sources in the Western European area:

^{5/} Europe's Growing Needs of Energy, How Can They be Met? Paris, 1956.

^{6/} Represents coal of 7,000 kcal. per kilogram or 12,600 B.t.u. per pound.

<u>Source</u>	<u>1955</u>	<u>1960</u>	<u>1975</u>
Coal	480	500	520
Lignite	31	35	35
Hydropower ...	57	75	130
Crude oil	13	25	50
Natural gas ..	5	10	20
	<u>586</u>	<u>645</u>	<u>755</u>

Taking the estimated demand for energy in 1960 and 1975 as the basis for primary consumption and subtracting the figures shown above for primary energy production, the following estimated gap between indigenous supply and demand, in terms of million tons of coal equivalent, is apparent:

	<u>1955</u>	<u>1960</u>	<u>1975</u>
Primary energy consumption..	730	840	1,200
Indigenous production.....	<u>586</u>	<u>645</u>	<u>755</u>
Deficit	144	195	445
Percent	19.7	23.2	37.1

In 1955 the gap was met by the importation of about 34 million metric tons of coal and 84 million tons of crude-oil and petroleum products.

It is too early to arrive at a basis for estimating the effect of the present Suez crisis on additional coal requirements in Western Europe. It is anticipated, however, that the rapidly diminishing oil reserves now in storage in the consuming areas will create an increased demand for solid fuels. Western Europe's oil-import requirements in 1954 were equal to about 113.7 million metric tons of coal equivalent and were estimated at 120 million tons in 1955. Even with emergency supplies from the United States, it is estimated that the supply of imported petroleum will decline about 25 percent during the interruption of traffic through the Suez Canal and Middle East pipelines.

Stoppage of the flow of oil from the Middle East through the Suez would seriously affect the fuel supply position of every Western European country. As of early November 1956 this waterway was completely closed to navigation, and some oil-transmission pipelines from Iraqi sources to the Mediterranean terminals were reported out of service. Rationing of petroleum to consumers in some areas was introduced at the end of November 1956. The flow of oil supplies formerly moving by tankers from the Persian Gulf area by the Red Sea - Suez - Mediterranean route to Western Europe must now use the only alternate route - the Indian and Atlantic Oceans by way of the Cape of Good Hope, more than twice the distance of the Suez route. The available oil-tanker fleet cannot supply even half the quantity of oil required by the Western European countries over this extended route. Distance and transport factors are more favorable from the United States and Venezuela, the two principal alternate sources of supply. At the close of November it was announced that suppliers in the United States will coordinate facilities for meeting European oil deficits to the extent of shipping approximately 500,000 barrels daily to Europe.

The following salient factors point up some of the problems that must be faced by Western Europe in the present oil-supply dilemma: The distance from Basra in the Middle East to Southampton via the Suez route is 6,500 miles, requiring 12 to 13 days, while the Cape route is 11,254 miles and requires 26 to 30 days for the trip. The approximate distances, in statute miles, from the United States and Venezuela to Channel ports in Europe are: New York, 3,113; Gulf of Mexico ports, 4,796; and Venezuela 4,005.

Before the closing of the Suez Canal, Western Europe's daily oil imports were about 2.5 million barrels, of which some 80 percent was from the Middle East. About 1.2 million barrels moved daily through the Suez, and 0.8 million barrels was shipped from Mediterranean ports served by pipelines from the Middle East oilfields. It is estimated that closure of the Suez will involve movement of a minimum of 800,000 barrels daily by way of the Cape route, and about 500,000 barrels daily will be obtained from the Western Hemisphere, mostly from the United States. Tanker vessels are in short supply and most of the 2,300 owned by the free countries are already in active service. The United States has about 645 tankers, of which 26 are in the emergency (mothball) fleet; 12 of these are scheduled to be released for active service.

In meeting the growing deficits in energy supplies, some European countries may face serious problems in their balance of payments, while others may be compelled to drain their already short dollar reserves in payments for continued heavy imports of fuel from the United States. Moreover, aside from the cost factors, there are risks in the increasing dependence of Western Europe on the Middle East oil supplies, particularly with respect to transportation, as recent developments have clearly demonstrated. Even before the present Suez difficulties, however, it was obvious that the capacity of the canal would be inadequate for the increasing oil movements over the next several years. Large tankers (60,000-100,000 deadweight tons) that could sail around the Cape of Good Hope at costs competitive with the smaller tankers using the canal had been built or were planned.

The strong demand for United States coal in the Western European countries in 1955-56 has led to considerable speculation regarding the extent to which the United States will participate in this market in the years ahead. Observations and analyses developed by the Federal Bureau of Mines representatives based on reports and estimates for future energy requirements of Western Europe by fuel experts of international organizations, such as the Organization for European Economic Cooperation (OEEC), the United Nations Economic Commission for Europe (ECE), and the European Coal and Steel Community (ECSC), indicate that, as long as no significant general economic or military disturbances occur, the United States will continue to be the principal external supplier of coal to European countries for many years.

In 1955 inland consumption of primary energy in Western Europe totaled 730 million metric tons of standard coal equivalent, of which coal supplied 74.3 percent; crude oil, 17.2 percent; hydroelectric power, 7.8 percent; and natural gas, 0.7 percent. Although coal's share in the total energy requirements has declined steadily since 1948, when it composed 83.2 percent of the total, coal consumption actually increased about 24 percent during the same period. This apparent paradox is explained by the fact that other sources of energy, particularly petroleum, have met an increasing share of energy requirements, a trend that is expected to continue. For example, by 1960 and 1975 total energy requirements are expected to increase to 840 million and 1,200 million metric tons in coal equivalent, respectively, but at the same time coal's share of the requirements is likely to decline from over 74 percent in 1955 to 64 percent in 1960 and 46 percent in 1975. Nevertheless, by 1975 coal consumption is expected to increase to approximately 605 million tons, or 12 percent above the 1955 level.

European coal experts agree that from 1956 to 1975 increased indigenous coal production in Western Europe is likely to lag behind requirements, and the gap between the two will be even greater than at present. Of the 33.6 million metric tons of coal imported by Europe in 1955, the United States supplied 25.0 million tons, or about 75 percent. The remaining imports were principally from Poland and the

U.S.S.R. High European coal imports continued unabated in 1956, and estimates for the year are placed at about 43 million tons, of which shipments from the United States are expected to reach approximately 39 million tons, or 91 percent. At the end of the first 10 months in 1956, United States exports to Europe were 32.8 million metric tons, exceeding the total 1955 exports by over 7 million tons.

Poland, a traditional supplier of coal to Western Europe, has rapidly increased production in recent years, but rising demand at home and in other Soviet Bloc countries is expected to limit any substantial increase in availability for export to Western Europe. The U.S.S.R. has also progressively increased coal production, which is rapidly approaching that in the United States. The U.S.S.R., however, faces the problem of maintaining supplies in pace with rising internal requirements and the needs of some of its satellite countries.

In 1955, Eastern Europe, principally Poland and the U.S.S.R., exported to Western European markets about 8.5 million tons, representing about 25 percent of the total coal imports of that area. It is apparent that limited available coal supplies for export form the major deterrent to Eastern Europe's attempts to participate to a greater extent in Western European coal markets. Strengthening this view is the fact that the c.i.f. (cost, insurance, and freight) price of Polish coal delivered to Western European ports almost consistently exceeds the prices for coal from the United States. Undoubtedly, both Poland and the U.S.S.R. would undersell United States coal in European markets if larger tonnages were available for export. Lacking such availabilities, however, it has been the policy of these countries to charge \$0.50 to \$2.00 per ton more than the delivered price for United States coal at Western European ports. In most instances, the values or prices are those agreed upon in trade agreements in which goods from Western European countries are exchanged for Polish or U.S.S.R. coal. Price is not always the controlling consideration where markets for indigenously produced goods are available, and valuable United States dollars or other foreign exchange may be conserved. It is the consensus of opinion that, although Eastern European countries are likely to continue limited activity in the Western European coal markets, the bulk of Europe's increased coal-import requirements will come from the United States.

The shortage in Poland's coal supply became more apparent in late 1956, when Polish foreign trade officials indicated a desire to import coking coal from the United States. The immediate requirement for United States coking coal was placed at 80,000 to 100,000 metric tons, and future requirements were estimated at an annual rate of 500,000 tons. Poland's current foreign-exchange position is unfavorable, and dollar reserves cannot provide for direct coal purchases in the United States. The extent to which negotiations may proceed toward realization of supplying Poland's import requirements is not now known.

In supplying overseas markets with coal from the United States, much depends on the stability of reasonable ocean-coal freight rates. As of August 1956 the delivered price for good-quality United States coal in European consuming areas generally ranged from \$2.00 to \$5.00 per ton more than the prices for indigenously produced European coal. Ocean-coal freight rates are traditionally unstable, subject to wide fluctuations depending on the availability of bottoms and cargo. As of November 20, 1956, the rate per gross ton from United States east coast ports to Rotterdam for single-trip movements was \$14.70-\$15.40, compared with \$5.30 per ton in October 1954. Rates for large-volume movements on long-term contracts, however, range from approximately \$1.00 to \$5.00 per ton less than single-trip rates.

In view of the promising outlook for continued large-volume exports of United States coal to Europe, a new corporation known as American Coal Shipping, Inc., comprising several major coal producers, the principal coal-carrying railroads, and the United Mine Workers of America, was recently organized to transport coal overseas. This organization proposes to operate coal-carrying vessels with a view to possibly reducing and stabilizing ocean freight-rate charges for overseas coal transport and to improve the competitive position of United States coals in European markets. In October 1956 the United States Maritime Administration authorized the release of 30 vessels from the emergency fleet for lease to this organization to begin operation. Fifteen additional vessels were recently obtained by this organization through acquisition of the Bull Steamship Lines. It is understood that the organization plans to construct additional large-capacity vessels later, when the initial stages of the operation have proved to be satisfactory.

Any further increases in ocean freight rates will necessarily be reflected in higher delivered prices to overseas consumers. Oil prices in the fuel market are approximately comparable with those of imported coal; but, if appreciable increases occur in the delivered prices of United States coal for an extended period, consumers will be forced to turn to greater use of oil as an economic necessity.

Prices for indigenous Western European coal have, on the average, increased to more than double those of 1938. Prices probably will continue to rise because of the increasing costs of production and new investment. Data for f.o.b. (free on board) mine prices for coal produced in the larger areas of Europe are included in the statistical annex of this review. In the postwar period of 1947-56, the delivered c.i.f. price of United States coal at European ports ranged from \$14.40 to more than \$20.00. Although the f.o.b. prices of United States coals loaded at Atlantic ports have increased to some extent in this period, the preponderant increases in c.i.f. prices can be traced to rising transatlantic freight charges.

It is significant to note the fact that most, if not all, of the United States coal exported to Europe in 1955-56 was purchased with free dollars, while in previous post-World War II years, the greater share of coal sales to the European areas was on the basis of dollars advanced by United States Government aid programs. It is also important to note that, while United States coal is purchased with dollars, ocean transportation is mostly confined to foreign-flag vessels, and the ocean freight charges are paid in the currencies of other countries. The dollar expenditures for transport are confined only to the rail movement from the mines to the Atlantic tidewater dumping ports, plus loading charges at the piers. Generally, most European countries charter foreign-flag vessels and the ocean-transport charges are payable in foreign currencies.

SUMMARIES OF ENERGY REQUIREMENTS AND CAPABILITIES IN INDIVIDUAL FREE EUROPEAN COUNTRIES

Austria

Austria's coal reserves consist mainly of lignite and small deposits of bituminous coal. There are also important hydroelectric resources, not fully developed. Austria's oil and natural-gas resources are the largest in Western Europe, and its production of these products represented over 40 percent of the combined output of the OEEC countries.

In 1955 the production of energy from primary sources was distributed as follows:

<u>Source</u>	<u>Unit</u>	<u>Production</u>
Bituminous coal	Million metric tons	0.17
Lignite	do.	6.62
Hydropower	Million kilowatt-hours	7.20
Crude oil	Million metric tons	3.30
Natural gas ...	Thousand million cubic meters	.76

The percentage distribution of total Austrian energy consumption in 1954, excluding fuelwood and peat, is shown below for each energy source:

Solid fuels	59
Petroleum products	18
Hydroelectric	22
Natural gas	1

The per capita consumption of energy in Austria is approximately 1.7 tons of coal equivalent as compared with an average of 2.5 tons for all OEEC countries combined.

Austria is a net importer of solid fuels. Quality coal, particularly coking coal, is nonexistent in indigenous sources and must be imported. Poland and West Germany are Austria's traditional major suppliers; but, because of increased internal coal demands in these countries in 1955-56, export availability has declined sharply. Deficits in Austria's import supplies are being met with larger shipments from the United States. Domestic production of coke in Austria is inadequate, and imports of this commodity are necessary to meet total internal requirements. In 1955 West Germany and Czechoslovakia were Austria's major coke suppliers, but continued large quantities from these sources are problematical in the light of increasing home requirements.

The following tabulation shows coal and coke import statistics, in thousand metric tons, for 1950, 1955, and January-July 1956:

<u>Origin</u>		<u>1950</u>	<u>1955</u>	<u>January-July 1956</u>
Coal	Czechoslovakia	263	188	18
	France	0	0	62
	Germany (West)	2,450	1,101	503
	Poland	1,472	1,159	599
	Saar	102	343	61
	United States	0	1,305	1,180
	Other	0	33	97
Total		4,287	4,129	2,520
Coke	Czechoslovakia	116	104	0
	Germany (West)	164	313	171
	Other	3	9	10
	Total	283	426	181
Total coal and coke		4,570	4,555	2,701

Benelux Countries

Belgium occupies fourth place and the Netherlands sixth in Western Europe as coal producers. Luxembourg has no coal but imports large quantities of coke from Belgium and West Germany for use in steel manufacture.

The Benelux production of primary energy in 1955, excluding small quantities of hydroelectric power, was as follows:

<u>Type</u>	<u>Unit</u>	<u>Belgium</u>	<u>Netherlands</u>	<u>Luxembourg</u>
Coal	Million metric tons	30.0	12.0	-
Lignite	do.	-	.3	-
Crude oil	do.	-	.9	-
Natural gas	Billion cubic meters	-	.1	-

Belgium

Belgium's energy economy is based essentially on coal, which represented about 80 percent of the total energy consumed. The remaining 14 percent was supplied largely by petroleum, all of which was imported.

In tonnage Belgium's coal production is adequate to meet internal demand and permit exports of about 3.5 million tons of steam coal annually. Because of the inadequate supply of metallurgical coals, however, coal must be imported from other countries. In 1955 Belgium imported 3.7 million metric tons of coal; and during the 9-month period, January through August of 1956, imports reached 2.6 million tons. The origin of coal imports, in thousand metric tons, is shown in the following table:

<u>Country</u>	<u>1955</u>	<u>January-August 1956</u>
France	574	259
French North Africa	10	9
Germany (West)	1,284	683
Netherlands	372	246
United Kingdom	485	337
U.S.S.R.	124	43
United States	783	948
Other	50	84
	<u>3,682</u>	<u>2,609</u>

In 1955 the consumption of coal totaled 28.7 million metric tons. The principal consumers were the coke-manufacturing industry, where 31 percent was processed into coke and coal chemicals; other major industries, 14 percent; electric power plants, 11 percent; households and small industries, 23 percent; and mine consumption, 10 percent. The remaining 11 percent was used by railways and other miscellaneous consumers.

Estimates of total energy requirements in Belgium for 1970 indicate an increase of about 40 percent over 1955. Although coal consumption is expected to increase by 6 million tons or 22 percent, coal's share of the total energy output is likely to decline from 86 percent in 1955 to 77 percent in 1970. Increases in coal demand for electric power, coke, and gas plants probably will more than offset the anticipated decline in consumption for household and miscellaneous uses.

Belgium's bituminous-coal and anthracite reserves are estimated at 11 billion metric tons, enough to assure a supply for more than 2 centuries at the 1956 rate of extraction. The coalfields in Belgium are located in what is known as the South Basin and the North or Campine Basin. The South Basin is in the areas of Mons, Centre, Charleroi, Namur, and Liege. The North Basin, in the Province of Limburg, extends east from Tessenderloo to the German border. The Belgian mines are privately owned; 72 companies operate 151 mines.

Coal seams range in thickness from a few inches to over 4 feet. The average thickness of seams is 24 inches, and some 12-inch seams are mined. It is common practice in some of the mines to work 6 to 12 seams simultaneously. The depths of workable seams vary considerably, and coal is extracted from levels, in some places, 5,000 feet below the surface. The average depth of all workings in the South Basin is 2,000 to 3,000 feet, and in the North Basin the average is 2,740 feet.

Belgian coals vary in rank from anthracite to high-volatile bituminous, with volatile-matter content ranging from 6 to 45 percent. The kind and quality of coals vary considerably, not only within the basins but in the same mines.

Productivity in the Belgian mines in July 1956 was 0.831 metric ton per man-shift overall. This low rate of output is due, for the most part, to the geological difficulties which restrict full mechanization applications.

The Netherlands

The Netherlands energy requirements are met with solid fuels and petroleum which account for 76 and 24 percent, respectively, of the total energy consumption. No hydroelectric power is produced in the country; and, because of the relatively small coal output, the Netherlands has intensified the development of oil refineries. In 1954 indigenous production of crude oil amounted to about 1 million metric tons. Large quantities of oil are imported.

The coal-mining industry in the Netherlands differs materially from that in other countries, since only 12 mines, concentrated in the area of Heerlen, in Limburg Province, produce the total output. Of this number, 4 of the largest mines are controlled by the Government enterprise known as State Mines, which produces approximately 65 percent of the national total. The remaining 8 mines are privately owned and operated.

Netherlands coals rank with the best in Europe and are anthracite and bituminous varieties. All the tonnage mined is washed and prepared before distribution to consumers. The calorific value of these prepared coals is approximately 14,000 b.t.u. per pound. A large proportion of the coal is of coking quality.

The coal-production capacity is not adequate to meet internal requirements, and the country must depend on imports to satisfy total needs, in spite of the increased use of petroleum. In 1955 coal imports amounted to 8 million metric tons, and the principal suppliers were as follows:

<u>Country</u>	<u>Thousand metric tons</u>
Belgium	3,019
France	132
Germany (West)	2,580
U.S.S.R.	128
United Kingdom	748
United States	<u>1,482</u>
Total	8,089

Total coal deliveries to consumers in 1955 amounted to 18.3 million metric tons, distributed as follows:

	<u>Percent</u>
Coke manufacture	28
Electric power plants	23
Major industry	13
Domestic and small industry	17

The remaining 19 percent was distributed to gas plants, railways, fuel-briquet plants, and mines.

Exports of coal from the Netherlands are relatively small and in 1955 amounted to 900,000 tons or about 8 percent of the production of 11.9 million metric tons.

Luxembourg

Luxembourg depends entirely on imports for its fuel requirements. Coke is the most important import commodity because of a highly developed iron and steel industry. In 1955 a total of 3.5 million metric tons of coke was supplied by neighboring countries. West Germany shipped 3.1 million tons, and the Netherlands and Belgium furnished 302,000 and 92,000 tons, respectively.

Coal imports in 1955 were 291,000 metric tons, of which two-thirds was from West Germany and the Saar. The remainder originated in Belgium and the Netherlands.

In 1955 the consumption of coal, according to use categories, was: Domestic and space heating, 35 percent; railways, 24 percent; industry, including electric power, 24 percent; and gas plants, 17 percent.

France

The fuels and power resources of France are limited, and its supply position in conventional fuels is not as favorable as that of other leading industrial nations.

France ranked 7th in the 1954 world coal production, 13th in lignite production, 10th in natural-gas production, and 6th in hydroelectric power generation. In world petroleum production for the same year it was far below the leading countries, ranking a low 26th.

In 1954 energy from indigenous sources was 76.6 million metric tons in standard coal equivalent, of which coal and lignite contributed 56 million metric tons, hydroelectricity supplied 15.7 million tons, and crude petroleum accounted for only 0.7

million tons. The remaining 5.2 million tons was obtained from peat, fuelwood, natural gas, liquefied petroleum gas, and shale oil.

In 1955 coal and lignite production amounted to 57.3 million metric tons, of which bituminous coals of various qualities comprised about 85 percent, anthracite and semianthracite 12 percent, and lignite 3 percent. As of October 14, 1956, the rate of production was slightly below that of the previous year, but lignite production was somewhat higher.

The principal producing mines of the coal industry, as well as the coke, manufactured-gas, electric, and coal-briquet plants are nationalized. The coal-producing areas are established on a regional basis. These regions and the annual output, in thousand metric tons, are shown below:

Region		1950	1954	1955
Coal	Nord et Pas-de-Calais	27,560	28,705	29,101
	Lorraine	10,347	12,996	13,157
	Blanzay	2,600	2,612	2,582
	Loire	3,585	3,330	3,355
	Auvergne	1,014	1,092	1,185
	Aquitaine	1,964	1,910	2,138
	Cevennes	2,716	2,819	2,841
	Dauphine	442	536	604
	Nonnationalized mines	767	405	372
Total		50,995	54,405	55,335
Lignite	Provence	993	1,133	1,260
	Nonnationalized mines:			
	Hostens	531)		635
		)	777	
Other		162)		158
Total		1,686	1,910	2,053

Total French consumption of primary energy (indigenous and imported) in 1954, was 105.6 million metric tons in coal equivalent, of which coal and lignite supplied approximately 65 million tons, or about 61 percent. Over one-third of the coal consumed in France is converted into secondary fuels, such as coke, briquets, and manufactured gas and for the recovery of chemical byproducts. Coke production was about 12 million tons and supplied approximately 75 percent of requirements. Over 80 percent of the coke output was of metallurgical grade, produced in byproduct-coke plants. The remainder came from manufactured-gas plants.

The 1955 coal consumption in France amounted to 62.5 million metric tons, distributed to consumers as follows:

<u>Consumer</u>	<u>Percent</u>
Coke plants	23.5
Major industries	20.8
Electric plants	11.8
Briquet plants	10.2
Household, space heating, and small industries	13.5
Mine consumption and miners	9.4
Railways	6.6
Other	4.2
	<u>100.0</u>

The following table shows French imports of coal and coke, in thousand metric tons, by countries of origin for 1950 and 1954-56:

	1950	1954	1955	January-August 1956
Coal:				
Belgium	780	1,301	1,224	1,009
Germany (West)	3,309	3,401	2,800	1,778
Netherlands	0	334	300	224
Poland	670	514	439	670
Saar	3,702	3,995	3,700	2,600
United Kingdom	1,248	994	950	548
United States	48	55	803	3,453
U.S.S.R.	29	404	550	470
Other	20	246	140	96
Total	9,806	11,244	10,906	10,848
Coke:				
Belgium	167	438	324	209
Germany (West)	1,937	2,163	3,381	2,272
Netherlands	335	571	722	496
Saar	1,193	628	523	408
Total	3,632	3,800	4,950	3,385

Although France requires large imports of coal, some exports, mostly small sizes and fines of noncoking quality, are shipped to other countries. In 1954-55 coal exports amounted to 2.7 and 5.8 million metric tons, respectively, most of which moved to Belgium, West Germany, Netherlands, Switzerland, and the United Kingdom.

French coal reserves are estimated at 12.6 billion metric tons. The estimate is based on measured, indicated, and inferred coal deposits to a depth of about 1,200 meters (3,936 feet). Approximately 75 percent of the French reserves is of bituminous rank, 22 percent is anthracite or semianthracite, and 3 percent is composed of lignite. Owing to the relatively short prospective life of coal reserves (200 years at the present rate of extraction), the French mining law requires that, in the interest of conserving resources, a maximum amount of coal must be recovered from all seams that can possibly be mined. Thus, thin 10- to 12-inch seams are mined in conjunction with the thicker seams. Approximately 90 percent of the coal is recovered. This, in addition to complicated geological disturbances, results in a high proportion of dirt, rock, and other extraneous matter being mined with the coal. For example, in 1951 a total of 76.5 million tons of raw product (coal and extraneous matter) was moved to the surface; but only 53.0 million tons of salable coal were recovered, or about 69 percent of the total amount extracted.

Coking coals are scarce in France; and, of the total bituminous production in 1955, only slightly more than 6 million tons of low- and medium-volatile coals was available. Because of the limited supply of coking coals and the high demand for quality coke, large quantities of metallurgical coals must be imported.

France cannot attain a position of self-sufficiency in coal, and continued reliance on imported coal in large quantities will be necessary to meet supply deficits. As in other European countries, the demand for coal and coke in France has risen with increasing industrial activity during the past 2 years. The tight coal supply situation in neighboring countries has forced France to look to the United States for increasing amounts of bituminous and anthracite coals.

Germany (West)

The Federal Republic of Germany is adequately endowed with coal reserves. Total recoverable anthracite and bituminous-coal reserves are estimated at 67.2 billion metric tons and lignite 63.0 billion tons.

Coal and lignite represent 95 percent of the total primary energy production, in terms of coal equivalent. In 1955 the total fuel consumption, in coal equivalent, was about 172 million metric tons, and the share contributed by coal and lignite amounted to approximately 88 percent, petroleum, 9 percent, and hydropower 3 percent. Imports and exports of coal have, in recent years, followed divergent trends. West Germany, traditionally a net exporter of coal, became a net importer in 1955, when coal exports were 12.8 million metric tons compared with imports of more than 16 million tons.

West Germany's coal output is believed to have reached about 135 million metric tons in 1956 (132.5 million tons in 1955). Approximately 93 percent of the total production is from mines in the Ruhr district and about 5 percent from the Aachen field near the Belgian-Netherlands border. The Ruhr coalfield comprises about 150 mines where the average working depth is about 2,550 feet, and the seams now being mined average about 45 inches in thickness.

Despite the sizable increase in coal production in 1956, the supply will not meet internal requirements and export commitments. The gap between the demand and production continued to widen in 1956, primarily because of increasing industrial activity, particularly in the steel and electric-power sectors. There will be a continued need for imported coal, a large portion of which will be supplied by the United States. The total coal imports in 1955 amounted to about 16.6 million metric tons, of which 8 million tons (largely coking coal) was from the United States. After the United States in importance, origins of coal imports, in million tons, were as follows: the Saar, 4.0; United Kingdom, 1.3; France, 1.3; Belgium, 1.0; Poland, 0.7; and the Netherlands, 0.3.

In 1955 West Germany exported 13 million metric tons of coal and 11 million tons of coke. Of the total coal and coke exports, 80 percent went to Austria, Belgium, France, Italy, Luxembourg, Netherlands, and Sweden.

The inability of West Germany's production to pace demand will require coal imports from the United States amounting to about 12 to 13 million metric tons in 1956, of which approximately 7 to 8 million tons will be of coking grades and the balance for steam uses.

Internal consumption of coal and brown coal (lignite) in West Germany in 1955 amounted to 135.7 and 91.7 million metric tons, respectively. The following tabulation shows, in percent, the amount of coal distributed to consumers:

<u>Consumer</u>	<u>Coal</u>	<u>Brown coal</u>
Coke and semicoke manufacture	39.7	1.9
Electric plants	8.8	33.6
Major industries	16.6	9.6
Railways	7.1	-
Briquet plants	4.6	37.6
Domestic and small industry	5.4	.5
Mine consumption and miners' coal	9.6	16.7
Gas plants	4.9	-
Other	3.3	0.1
Total	100.0	100.0

The demand for coal by electric power plants in 1956 is expected to be between 12 and 15 percent higher than in 1955, and electric-power output probably will be doubled by 1965. Continued increases are expected in the demand for products of the steel industry, which in August 1956 was 14 percent above the 1955 output. The use of oil for fuel at power stations and other industries is relatively small at present. As the gap between oil and coal prices narrows, however, the use of oil may expand rapidly. In 1955 fuel oil provided less than 3 percent of the total energy output, but conversions from coal to oil in certain industries and for space heating are increasing annually. Present (1956) prices of fuel oil are higher than those of coal. If oil interests are successful in their efforts to eliminate the prevailing tax on imported crude oil of DM 15.00 (US\$3.57) per metric ton, oil prices (on a B.t.u. basis) will be more competitive with coal prices.

The production of lignite (brown coal) in West Germany is significant and in 1955 amounted to 90.5 million metric tons, providing about 26 million tons of standard coal equivalent. Lignite is recovered by strip-mining methods, and the largest areas of production are in the Cologne and Braunschweig-Helmstedt districts. The most important consumers of lignite are the thermoelectric power and brown-coal-briquet industries in the lignite-producing areas.

The German coal-mining industry is under private ownership; and, except for Belgium and the Saar, is the only large coal-producing area in Europe that is not nationalized. The industry is planning to increase coal output to 150 million metric tons by 1965 through improvement of productive processes and concentration of production at the more productive operations. The plan also extends to the development of new mines, from which an additional 20 million tons annually is anticipated by 1975. Increased output is becoming more difficult, and production costs are constantly rising because each year greater depths must be reached (an average of 35 feet annually) to recover the coal.

To meet the increasingly difficult manpower supply the ministry of Labor has recently concluded an agreement with Japan providing for the procurement of 500 Japanese coal miners for work in the Ruhr mines.

Greece

The energy resources of Greece are small. Except for lignite, fuelwood, charcoal, and small hydroelectric development, this country depends upon foreign sources for its energy requirements. Although estimated Greek lignite reserves exceed 4 billion metric tons, only a small fraction of these resources is being utilized.

In 1955 the production of primary energy in Greece amounted to approximately 850 thousand metric tons of lignite and about 35 million kw.-hr. of hydroelectricity.

The percentage distribution of total Greek primary-energy consumption in 1954, excluding fuelwood and charcoal, is shown below for each source:

Solid fuels	17
Petroleum products	82
Hydroelectricity	1

Imported coal and coke in 1955 amounted to 249,000 and 21,000 metric tons, respectively, and was supplied by the following countries:

	<u>Coal</u>	<u>Coke</u>
Origin		
Germany (West)	55	14
United Kingdom	56	2
United States	138	5

Ireland (Eire)

Ireland is a coal-importing country, and its major indigenous solid-fuel resources consist of limited coal reserves and considerable reserves of peat. In 1955 Irish coal production amounted to 193,763 tons; coal imports were 1.8 million tons; and peat production was reported to have exceeded 1 million tons. Excluding very small quantities of fuelwood, apparent solid-fuel consumption in Ireland in 1955 amounted to about 2.5 million tons in standard bituminous-coal equivalent, of which imported coal accounted for approximately 72 percent, indigenous peat 20 percent, and indigenous coal 8 percent.

All of Ireland's coal imports in 1955 were supplied by the United Kingdom and the United States. According to official Irish statistics for 1955, 1.7 million tons of coal were imported from the United Kingdom and 50,310 tons from the United States.

The record Irish peat production of over 1 million tons in 1955 included about 640,000 tons of sod peat for use in electric-power generation and in domestic industrial and household fuel markets. About 400,000 tons of the production was comprised of milled peat, which is used either in manufacturing peat briquets or consumed in newer peat-fired powerplants. Peat-briquet production in 1955 amounted to 34,698 tons.

Ireland's large peat reserves make peat the country's major indigenous solid-fuel resource. Reserves of peat, never accurately determined, were estimated by one source at about 2,700 million tons in bogs covering 2,536,428 acres or about one-seventh of the total land area. The Irish Peat Board (Bord Na Mona) established by the Government to develop the country's peat resources, embarked on a peat-production program that eventually will bring the output of sod peat to 1 million tons and milled peat to 2.5 million tons annually.

The coal reserves of Ireland are comprised of anthracite and semibituminous deposits, which are of commercial grade in only three locations in the northwest and the Midlands. Total reserves of the Connacht (Arigna), Leinster, and Slieveardagh fields amount to about 18.8 million tons, of which some 6.6 million tons is classified as semibituminous and the remainder anthracite.

Typical analyses of Irish coals by coalfields (dry basis) are as follows:

	Connacht Semibituminous, <u>percent</u>	Leinster Anthracite, <u>percent</u>	Slieveardagh Anthracite, <u>percent</u>
Carbon	76.8	92.3	82.5
Volatile matter ..	16.0	4.5	3.7
Ash	7.2	3.2	13.8
Sulfur	1.6	1.45	2.11
Kg.-cal. per kg...	7,797	8,347	6,825
B.t.u. per pound..	14,035	15,025	12,285

Irish anthracite is difficult to handle because of its extreme friability.

A significant increase in Irish coal production is not to be expected. The coal seams are generally thin, averaging about 1 to 2 feet in thickness, and mining conditions are complicated by folds and faulting. Many of the better seams have already been worked out. The productivity of Irish miners is also low compared with principal European coal-producing countries.

Italy

Italy depends on imports to meet the bulk of its coal requirements, since production from indigenous sources consists primarily of small tonnages of substandard coal and lignite. In 1955 coal consumption amounted to 11,455,000 metric tons of standard coal equivalent, of which only 1,074,000 tons, or 9 percent was obtained from Italian mines. Production from indigenous sources consists chiefly of low-grade bituminous coal of high sulfur and ash content from the inefficient high-cost Sardinian mines and lignite from mining operations largely in the Province of Tuscany, near Grosseto and the Valdarno Valley, and in the Province of Umbria, in the area south and southwest of Perugia.

Production of solid fuels in Italy for 1955 is shown in the following:

	Average calorific value (B.t.u. per pound)	Thousand metric tons
Anthracite	9,576	48
Bituminous coal	10,800	1,087
Lignite:		
Picea (coaly)	7,740	72
Xyloid (woody)		
Torbosa (peaty)	4,500-7,000	345
Coke:		
Metallurgical	6,300	2,949
Gas	6,000	979

About 40 percent of the indigenous production of coal and lignite is consumed at central-electric-power stations in Sicily and Sardinia and 24 percent by the building-materials industries. In 1955 coke and gas plants consumed over 50 percent of the imported coal. Other significant consumers of imported coal are the railroads, chemical and building-materials industries, and electric-power stations.

The bulk of Italy's coal imports consists of high-grade coking, gas, and steam coals and some anthracite and coal briquets. In 1955 coal imports amounting to 10,317,000 metric tons were obtained principally from United States (55 percent) and West Germany (28 percent). The United Kingdom supplied slightly over 7 percent and U.S.S.R. and Poland only 3 percent. The remaining 7 percent came principally from Belgium, France, and the Saar. Italy's 1955 imports of solid fuels, by type of fuel and country of origin, are shown in table 5 (p. 39).

For the period January through August 1956, total Italian solid-fuel imports amounted to 7,263,000 metric tons, or nearly 6 percent more than in the comparable period of 1955. The United States' share was 57.6 percent, whereas Poland and U.S.S.R. together supplied only about 2.4 percent.

Although coal is still one of the major energy sources in Italy, it is losing ground steadily to other competitive fuels. From 1938 to 1955 the total consumption of energy (excluding noncommercial fuels, such as firewood and charcoal) in Italy increased about 69 percent. Consumption of coal, however, was down about 18 percent, and its share of total energy consumption declined from 49 percent in 1938 to approximately 25 percent in 1955. This change in the energy requirements of the country stems from the increased use of natural gas, petroleum products, and hydroelectric power, which displaced coal in certain economic sectors, and, at the same time, absorbed the bulk of the country's increased energy requirements.

The following tabulation shows the percentage of energy and power consumption (excluding bunker-fuel loadings) supplied by the various sources of energy:

	<u>1938</u>	<u>1951</u>	<u>1955</u>
Coal	49.4	32.6	24.8
Petroleum products	10.7	20.0	27.7
Natural gas	.1	3.1	8.9
<u>Hydroelectric power</u> ^{1/}	39.8	44.3	38.6

^{1/} Includes geothermal power (natural underground steam).

The trend toward the substitution of competitive fuels for coal is expected to continue in the years ahead. The seeming paradox of increasing coal consumption in recent years despite the loss of markets to competitive fuels is due to the sharp increase in use of coal at coke-oven installations, gasworks, and electric-power stations, offsetting the decline in coal consumption by other users.

Portugal

Portugal's coal resources, estimated at 20 to 30 million metric tons, consist of poor-quality anthracite, with a high ash (up to 50 percent) and sulfur (3 percent) content, and some lignite. The principal coal and lignite deposits occur along the coastal areas north of the Tagus River in the districts of Aveiro, Coimbra, Leira, Porto, and Santarem.

In 1955 Portugal produced 406,000 metric tons of anthracite and 90,000 tons of lignite. The standard coal equivalent of this combined output was approximately 335,000 metric tons. Anthracite is mined principally at the Sao Pedro de Cova mine, about 9 miles east of Oporto, and the Pejao mine on the south bank of the Douro River between Pedorido and Paraiso, while lignite production is centered in the Cape Mondego area.

Indigenous production is inadequate, however, and Portugal depends on imports for a major part of its coal requirements. Coal imports, predominantly bituminous gas and steam coals, amounted to approximately 490,000 metric tons in 1955 and represented about 60 percent of total coal and lignite requirements. In recent years, the United Kingdom (72 percent in 1955) was the principal source of supply while the United States and West Germany ranked second and third, respectively, in order of importance. Portugal's coal and coke imports for 1955 follow (in thousand metric tons):

	<u>Coal</u>	<u>Coke</u>
United Kingdom	354	-
United States	70	-
West Germany	38	22
Other	<u>28</u>	<u>-</u>
Total	490	22

Coal imports for the first 8 months (January through August) of 1956 amounted to 310,000 metric tons, of which 42 percent was supplied by the United Kingdom, 37 percent by the United States, 16 percent by West Germany, and the balance by other countries. Because of inadequate coal supplies for consumers in the home market, the United Kingdom in 1956 initiated a policy of reduced coal exports. This situation became more acute late in 1956 because of the Suez Canal crisis. As a result, Portugal is importing increasing coal tonnages from the United States. Coal consumption in Portugal amounted to about 846,000 metric tons in 1955. About 54 percent was consumed for industrial uses (including small tonnages for space-heating homes and buildings). Consumption by railroads and electric-power stations and supplies for vessel bunker fuel account for 25 percent, gasworks and briquet plants about 20 percent, and miscellaneous uses 1 percent. Coal requirements for railroads, electric power, and vessel bunker fuel have declined sharply in recent years and are expected to continue to decrease because of extensive hydroelectric power development and more widespread use of petroleum products in place of coal. The following data show the percentage share of each energy source in the fuel economy of Portugal:

Petroleum products	53
Solid fuels	29
Hydroelectric power	<u>18</u>
Total	100

Saar

The Saar is one of the richest and most important coalfields in Europe. Estimated recoverable reserves are placed at 2.8 billion metric tons. It is the only European area where primary energy production far exceeds consumption requirements. The area's net exports of coal in 1955 were 8.7 million metric tons, or about half the total production.

In 1955 bituminous-coal production at the 20 mines in the Saar area amounted to 17.3 million metric tons, the highest output of record. Approximately 5.2 million tons of the coal produced in the Saar were processed into about 4 million tons of coke for use in the metallurgical industry.

Coal represents about 96 percent of the total primary energy consumed in the Saar and petroleum the remaining 4 percent. The percentage distribution of coal consumption (9.1 million metric tons) in 1955 by principal consumers was as follows:

Coke manufacture	57
Mine and miners' use	20
Electric power	10
Railways, industrial, and household ...	13
	<u>100</u>

Employment in the Saar coal mines in 1955 was reported at 56.6 thousand workers, and output per man-shift was 1.81 metric tons underground and 1.16 overall. The underground productivity was the highest reported in the European coal-producing countries.

Although the Saar is a net exporter of coal, approximately 1 million metric tons is also imported annually. In 1955 imports were 817 thousand tons from West Germany and 205 thousand tons from France.

Coal exports from the Saar in 1955 amounted to 9.8 million metric tons, most of which was shipped to West Germany and France. The following table shows the principal countries to which Saar coal moved in 1955 (in thousand metric tons):

<u>Country</u>	<u>Coal</u>	<u>Coke</u>
Austria	245	2
France	3,692	523
Germany (West)	4,050	145
Switzerland	440	0
United Kingdom	742	0
Other	602	3
Total	<u>9,771</u>	<u>673</u>

Scandinavian Area

Denmark and Finland

Denmark and Finland do not have coal resources and must depend on imports to meet requirements. Some low-grade lignite and peat are produced in Denmark, but these fuels have secondary importance in the overall energy balance. Imported sources of energy composed the following percentages of total consumption (in coal equivalent): Solid fuels, 68 percent; petroleum, 32 percent.

In Finland there are vast undeveloped peat resources, but only small quantities are produced (150,000 metric tons or about 75,000 tons in coal equivalent in 1954) and used, principally by the railroads and for space heating. Fuelwood, of which there are plentiful supplies, is a significant source of energy in Finland. In 1955 commercial sales amounted to 28.3 million cubic meters, or 4.7 million metric tons in coal equivalent, representing about 63 percent of the total solid-fuel consumption.

The coal and coke imports of Denmark and Finland in 1955 (in thousand metric tons) follow:

Origin	Denmark		Finland	
	Coal	Coke	Coal	Coke
Belgium	21	184	66	10
France	399	90	120	17
Germany (West)	213	1,115	0	96
Norway	11	0	3	0
Poland	513	51	1,511	1
United Kingdom	3,652	741	153	136
United States	286	16	154	0
U.S.S.R.	0	0	188	135
Other	176	114	49	37
Total	5,271	2,311	2,244	432

Exports of coal and coke from the United States to Denmark and Finland during January-August 1956 were as follows (in thousand metric tons):

Type	Denmark	Finland
Anthracite	0	5
Bituminous	244	99
Coke	2	0
Total	246	104

Norway and Sweden

Norway's coal requirements are relatively small, compared with other European areas, largely because of the abundant supply of hydroelectric energy upon which most of the country's industries depend. Of the total energy consumed, excluding fuelwood and peat, approximately 65 percent is derived from hydroelectricity and only about 11 percent from coal and coke; the remaining 24 percent is provided by imported petroleum. Peat and fuelwood are widely used as fuels for space heating of homes and buildings and small industries.

There is no coal worthy of development on the mainland of Norway. On the island of Andoy small deposits of inferior coal exist but these are considered unprofitable for commercial mining.

On Spitsbergen (Svalbard), in the Norwegian Archipelago in the Arctic Ocean, there are extensive coal reserves which are conservatively estimated at 8 and 9 billion metric tons. In 1955 the 4 Norwegian coal mines in this area produced 322,000 metric tons (341,000 tons in 1954). Three mines are operated on Spitsbergen by the U.S.S.R., through a concession from Norway. Output from these mines amounts to about 250,000 tons annually and is exported to Murmansk, U.S.S.R. In view of present European demand efforts are being made to expand production to approximately double the output by 1959-60. Of the 1955 production about two-thirds moved to northern Norway ports, and the remainder was exported, chiefly to Germany (103,000 metric tons).

Two principal factors operate against broader use of the Spitsbergen coals: (1) The characteristic disintegration of the coal into small sizes after thawing and (2) the short shipping season during the summer months when harbors are free of ice and safe for navigation.

In Sweden there are small coal deposits in the area of Hoganas; but the product is of inferior quality, high in ash and moisture content, and suitable only for

low-pressure steam generation in small industry. In 1955 production amounted to 282,000 metric tons (190,000 tons in standard coal equivalent) which is representative of the average annual output.

Energy consumption in Sweden in 1955 indicated that petroleum (all imported) was the predominant source, followed by hydroelectricity, coal, and coke. The percentage distribution of total energy consumption, excluding fuelwood and peat, by sources of energy, follows:

Petroleum	40
Hydroelectricity ...	36
Coal and coke	24

Norway and Sweden must rely on imports to supply the bulk of their coal and coke requirements. Coal imports of both countries during 1955 showed sharply reduced tonnages from the United Kingdom and Poland, where domestic coal shortages and other commitments curtailed exports.

Coke imports from traditional suppliers were also behind previous levels. The inability to obtain full import requirements from traditional European sources was reflected in larger exports from the United States. In 1955 these countries imported 980,000 metric tons or 432,000 tons more than in 1954. Estimates for 1956 United States coal requirements are placed at 1.2 million tons. The following table shows Norwegian and Swedish coal and coke imports, by originating countries, for 1955, in thousand metric tons:

Origin	Norway		Sweden	
	Coal	Coke	Coal	Coke
Belgium	25	7	38	12
Germany:				
West	19	108	373	1,682
East	6	0	107	0
Netherlands	14	18	0	451
Poland	6	0	875	30
Saar	0	0	240	12
Spitsbergen	0	0	20	0
United Kingdom	239	461	999	289
United States	412	0	568	0
U.S.S.R.	0	0	97	23
Total	721	594	3,317	2,499

Although the demand for imported coal and coke in 1955 and 1956 (estimated) was higher than in 1954, it was considerably below the pre-World War II levels owing to the steady rise in hydroelectric power development and the increased use of petroleum. In 1937 Norway and Sweden imported coal and coke in the amounts of 3.2 and 9.0 million metric tons, respectively, compared with 1.3 and 5.8 million tons in 1955.

Spain

Spain's coal resources, estimated at 2.2 to 4.8 billion metric tons, consist largely of bituminous coal, anthracite, and lignite, most of which is of substandard quality.

Coal is mined from seams ranging from 2 to 8 feet in thickness, varying in pitch from 0° to 80°. A high percentage of manual labor is utilized since most of the coal is mined with pneumatic picks. Output per manshift is low (about 0.5 metric ton) due to difficult mining conditions, lack of skilled mine workers, and the small degree of mechanization. Miners generally work a 7-hour day, 6 days a week.

In 1955 coal production amounted to nearly 14.3 million metric tons, of which 10.5 million tons was bituminous coal; 2 million tons, anthracite; and 1.8 million tons, lignite. The bulk of the bituminous coal, including coking coal, is mined in the Province of Oviedo in the northern part of the country, while most of the anthracite is produced in the Province of Leon and lignite in Teruel and Barcelona Provinces.

Production of coal and lignite increased nearly 2 million tons from 1950 to 1955, primarily because of mine modernization and use of newly purchased mine equipment and machinery. Despite this rise in production, indigenous coal output is still short of demand, and imports are required to make up deficits in requirements. In 1955 coal and coke imports amounted to 554,000 and 120,000 metric tons, respectively. Coal imports, consisting largely of high-grade bituminous steam and coking coals, were obtained chiefly from the United States (72 percent) and, to a lesser extent, from the United Kingdom, West Germany, and France.

The principal consumers of coal in Spain are the railroads, coke and steel plants, industry, and the electric-power stations. Most of the lignite is used by the textile, cement, ceramics, and chemical industries and to a small extent by householders and electric-power stations. Because of shortages and inadequate transport facilities, coal supplies are allocated to consumers. In addition, consumers are required to use stipulated proportions of indigenous coals.

Additional funds are being made available to the coal-mining industry to continue its program of mine modernization, to develop new mining sites in an effort to increase coal production, and to reduce import requirements. Spain's production and imports of solid fuels for 1954 and 1955 follows (in thousand metric tons):

<u>Production</u>	<u>1954</u>	<u>1955</u>
Bituminous coal	10,434	10,466
Anthracite	1,964	1,960
Lignite	1,755	1,828
 Briquets and ovoids	 1,125	 1,167
Metallurgical coke	1,222	1,446
Gas coke	245	259

Imports

Bituminous coal	965	1/ 554
Metallurgical coke	130	2/ 120
<u>Briquets</u>	18	7

1/ United States 72 percent, United Kingdom 14 percent, France 7 percent, and West Germany 7 percent.

2/ United States 36 percent, Italy 35 percent, Netherlands 14 percent, United Kingdom 8 percent, and Belgium 7 percent.

Switzerland

Like Norway, Switzerland obtains the largest supply of energy from indigenous hydropower sources. The hydroelectricity development primarily results from the lack of other natural resources for the production of energy. Thermal electric power is produced mostly from fuel oil, which is used mainly in winter as a supplementary source when water flow is inadequate.

Switzerland depends almost entirely on imports for coal, coke, and oil, but, when supplies are short, the small anthracite, lignite, and shale deposits of the country are worked. The coal output in recent years from these indigenous sources has not exceeded 10,000 tons annually.

The percentage distribution of the total energy consumption, by types of fuels, in Switzerland in 1954 was as follows: Solid fuels, 26 percent; petroleum products, 23 percent; and hydroelectricity, 51 percent.

Imports of coal and coke in 1955 amounted to 1.8 and .06 million metric tons, respectively. The principal sources for solid-fuel imports were West Germany, France, and the Saar, which furnished about 70 percent of the total. The United Kingdom was a large supplier in earlier years, but receipts in 1955 had fallen to only 20,000 tons of coal and 26,000 tons of coke. In the same year the United States supplied Switzerland with only 11,000 tons of coal, a sharp decline from 247,000 tons in 1954 and 639,000 tons in 1952.

Data for individual consumer use of the coal and coke imported into Switzerland are not available. It is known, however, that sizable quantities of the supply are used in households, space heating, gas plants, and metallurgy. No solid fuels are exported from this country.

United Kingdom

The United Kingdom is the largest producer of coal in Western Europe and the third largest in the world. Of the 225 million long tons produced in 1955, about 213 million tons was obtained from 800 underground mines and approximately 12 million tons extracted from open-cast (strip) mines. This production included 4 to 5 million tons of anthracite, all of which is produced in South Wales and Scotland.

Coal, which represents about 99 percent of the total output of energy from indigenous sources, comprises 86 percent of total energy consumption, despite substantial imports of petroleum.

About 20 percent of the coal mined goes to thermal electric-power production, and approximately 24 percent is distributed (12 percent each) to the coke and manufactured-gas industries, while household and space heating take about 26 percent. The remaining 30 percent is distributed to railways, miscellaneous industry, and navigation.

In 1955 the consumption of coal in the United Kingdom amounted to 222 million long tons, or 4.3 tons per capita. On the basis of an average annual increase of 2 percent in coal requirements, with no great change in fuel required for space heating, there will be an annual coal demand of about 267 million tons in 1965. The estimated maximum coal production for 1965 under the National Coal Board's Revised Plan was placed at 250 million tons, which means that deficits in indigenous supplies will be chronic.

Other sources for energy in Great Britain are being applied and developed. Currently, the annual consumption of oil (amounting to approximately 30 million tons in coal equivalent) is going into energy production. Supplies from this source may be expected to be used more widely in the future. The program for constructing nuclear-powered electric plants is making favorable progress. The Calder Hall plant, a prototype of 12 nuclear power stations planned for completion in the next 10 years, began the first stage of operation in October 1956, and full capacity of 65,000 kilowatts is expected to be reached early in 1957. By 1965 electric energy from nuclear sources will be in production at the rate of 5 to 6 million tons of coal equivalent. This type of energy will not displace coal in the overall consumption pattern but will serve as a supplemental power supply.

Great Britain imported 11.5 million metric tons of coal in 1955 (5.5 from the United States), representing a wide departure from this country's position in the past years, when it was the major world coal-exporting country. Coal exports in 1937 were 40.3 million metric tons, but in 1955 shipments to foreign areas had declined to 14.5 million tons. In 1955 restrictions were placed on United Kingdom coal exports to conserve supplies for internal requirements. In 1956, however, imports were being progressively reduced, largely as a result of curtailment in exports and to conserve foreign exchange. The National Coal Board announced that 5.5 million tons would be the maximum amount of coal to be imported in 1956, of which 3.1 million tons will come from the United States. Coal from the United States is used chiefly by gas plants, electric-power stations, and general steam plants.

The following table shows imports of coal, by countries of origin, in thousand metric tons, for 1954-55 and January-September 1956:

Country	1954	1955	January-September 1956
Belgium	887	1,574	631
Canada	-	159	185
France	1,002	2,774	482
Germany (West)	389	200	2
Poland	266	1,382	820
United States	509	5,454	2,666
Other	0	5	1
Total	3,053	11,548	4,787

Although large reserves of coal remain in the United Kingdom (estimated to last for at least 200 years at the present rate of extraction), the country continues to face a coal shortage, largely because of the low level of investment in the mining industry in 1931-47. Only one-fifth of the industry's output at the time of nationalization (1947) came from mines developed during the preceding 30 years. In recent years there were substantially increased investments in the industry; but, because new mines and major reconstruction projects require many years to complete, the benefits from these investments are not immediately evident.

The total coal output for the first 44 weeks in 1956 was only 300 thousand metric tons more than in the same period of the preceding year. Most of the increase is reflected in the reduction of the number of labor stoppages and holidays experienced in 1955. Productivity in the British mines is not likely to rise appreciably, although constant attention is given to stimulating workers to greater effort. In 1955 the overall output per man-shift was 1.245 metric tons, compared with 1.250 in 1954 and 1.211 in 1950.

Coal requirements in the first half of 1956 continued to exceed those of the previous year by almost 1 million tons. The largest increase in demand was confined almost entirely to the electric-power, coke, and gas industries.

The substitution of oil for coal is expected to continue at an increasing rate as coal prices advance and supplies become more difficult to obtain. Increasing quantities of oil products are being used by householders, the steel industry, other industrial groups, and electric-power stations. In 1955 oil used by the steel industry alone amounted to 2 million tons in coal equivalent. Fuel requirements in 1956 are expected to rise sharply and probably will require an increased shift to oil if enough coal is not available. Seventeen new electric-power stations, under construction or planned, will be equipped for dual firing, to burn either coal or oil. In 1956 it cost more to produce electricity from oil fuel than from coal. The difference in cost between oil and coal, however, is narrowed at electric-power plants near refineries, and oil is probably competitive with coal-fired plants some distance from the coalfields. Fuel requirements for electric-power stations in 1960 are estimated to reach 50 million tons in coal equivalent, of which 42 million tons will be consumed at coal-fired plants.

As regards coal prices in the United Kingdom, it is difficult to reach accurate conclusions. Prices for coal to large consumers are made on a contract basis and vary widely with volume and conditions, much the same as in the United States. For whatever value they may have as general information, some available price data are shown in the following:

The average rail haul of coal from the mine to consumer is about 56 miles. The average rail cost is roughly 10-11 shillings or \$1.40-\$1.54 per ton.

Average price of coal at the pithead (early months of 1956) was 75 shillings or \$10.50 per long ton.

Average price of coal at the pithead for export was 110 shillings or \$15.40 per long ton.

Retail prices of coal are fixed for each zone, regardless of the origin of coal. For example, in the London area retail prices range from \$15.98 per ton for grade 7 to \$26.22 per ton for grade 1.

Yugoslavia

Coal production in Yugoslavia reached 15,200,000 metric tons in 1955 and showed an 11-percent increase over the 1954 output. Because Yugoslavia reserves of bituminous coals are limited and of relatively poor quality, most of the production is supplied by brown-coal (50 percent) or lignite (42 percent) mines. Brown coals are older, more matured lignites of 4,000 to 5,000 kcal. per kilogram; lignites are younger and have a calorific value of about 2,000 kcal. Total Yugoslav coal production, by types of coal, for selected years is given below in thousand metric tons:

	1938	1950	1953	1954	1955
Bituminous	522	1,154	925	988	1,137
Brown coal	4,310	7,204	6,362	7,100	7,682
Lignites	1,301	4,461	3,959	5,575	6,388
Total	6,133	12,819	11,246	13,663	15,207

Low-grade lignites, which have shown the largest gains in Yugoslavia's increasing coal production, are expected to contribute the bulk of an additional 1,000,000 tons to be produced in 1956. Most of the production gains since the close of World War II can be attributed to large capital investments, the introduction of modern machinery and equipment, and the concentration on mining more favorable lignite deposits, largely in new large-scale strip-mining operations. It is estimated that, when current expansion plans are completed, approximately 35 percent of the total coal production will be strip-mined.

With the increase in production, there has also been a noteworthy increase in coal imports to supply the country's growing requirements of higher quality metallurgical coals. Imports of coal (anthracite and bituminous) are shown below, in thousand metric tons, for selected years:

<u>1938</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Insig.	449	617	1,003

Of the 1955 coal imports, 626 thousand tons, mostly of coking quality, were from United States, 207 thousand tons from Soviet Bloc areas, and the balance from Western European countries.

The significantly larger coal imports in 1955 resulted, in part, from Yugoslavia's improved relations with Soviet Bloc countries.

In spite of the increased production and imports, coal supplies still lag behind the high demands brought on by the transition of Yugoslavia from an agrarian to a semi-industrialized state. The trend of rising coal requirements is expected to continue for years to come, and the country will become even more dependent upon foreign sources of supply for a large portion of its higher quality coal demand. The Yugoslav coal industry will be unable to meet the growing national coal requirements for lower grade coals unless enough investment funds are made available for a new coal-development program.

Current problems facing the Yugoslav coal industry in its efforts to increase coal production include the lack of enough trained personnel, adequate miners' housing, and supplies of mining materials and equipment and the relatively high costs of mining generally associated with low productivity.

DESCRIPTION OF COAL SUPPLY AND REQUIREMENTS IN THE SOVIET BLOC COUNTRIES

Albania

Albania's coal reserves are small, but an adequate geological survey has not yet been made. Known coal deposits are lignitic and have a calorific value comparable to that of other higher grade European brown coals.

Although absolute figures for coal production have not been published in recent years, Albania's planned production data indicate that coal output was somewhat as follows:

<u>Year</u>	<u>Metric tons</u>
1938	3,800
1947	7,700
1948	22,000
1950	56,000
1955	336,000

Since 1947 and through four economic plans, data on coal production was included in the general mineral-production plan, which was reported several times to be far below expected output. One can best assume that the actual coal production may range anywhere from 150,000 to 350,000 tons. The practice of reporting only relative percentage data is greatly exaggerated when such small tonnages are considered. If an all-out effort to increase coal production were made, it would be well within the capabilities of Albania's coal mines to produce the planned output.

One of the principal problems encountered in increasing coal production is transportation. Albania is a mountainous, agricultural country, and its coal deposits are near the capital, Tirana, and Korce not far from Ochrid and Prespa Lakes on the Yugoslav frontier. Mining has been most active in these two locations because of their proximity to local consuming centers.

Bulgaria

Bulgarian coal resources consist of anthracite, bituminous, and lignite deposits. Lignitic coals are the most significant in the Bulgarian economy, because of their quality and the extent of the deposits. Lignites include the higher grade brown coals of Western Bulgaria, where most of the production centered in earlier years, and the lower grade lignites of the southwestern part of the country, which has been under development since World War II.

In 1955 Bulgarian coal production totaled about 10 million metric tons, over 4 times the volume of prewar production. At the end of the first Five-Year Plan (1952) coal production had reached 7.4 million tons. During the first half of 1956 coal production reached nearly 5.3 million tons, or a rate of 10.6 million tons annually.

Continued expansion in the Bulgarian coal industry to a level of 14 million metric tons is contemplated by the end of the current Five-Year Plan in 1957. The achievement of this goal lies within the country's capabilities but will be largely through development of low-grade lignite surface (strip) mines. Before World War II over three-fourths of national production came from the State-owned high-grade lignite mines of the Pernik Basin, east of the Bulgarian capital of Sofia. Although production in this basin has been intensified, the most significant gains in subsequent years can be attributed to the development and mechanization of new surface-mining operations, particularly the Maritsa Basin. Bulgaria's strip mines were increased from 2 to 5, according to the Second Five-Year Plan. Strip mining was reported to have been completely mechanized.

Bulgaria's lignite production in 1957 is expected to reach an estimated 13.1 million tons; the hard-coal (bituminous and anthracite) production goal was set at some 860,000 tons. In 1952, at the end of the country's first Five Year Plan, lignite production was 6,880,000 tons; hard-coal output totaled 53,000 tons.

Bulgaria is self-sufficient in all types of coal. The movement of coal from Bulgaria to foreign markets is not believed to be of significant volume.

Czechoslovakia

Bituminous-coal and lignite production in Czechoslovakia in 1955 amounted to 23.2 million and 40.7 million metric tons, respectively, showing a healthy gain over the 1938 level which was regained a year before the country's alliance with the U.S.S.R. Of the total bituminous production, approximately 85 percent is obtained from the Ostrava-Karvina Basin, the source of some of Europe's highest grade coking coals. Total coal production, by types, in thousand metric tons, for selected years, follows:

Year	Bituminous	Lignite	Total
1938	15,836	16,027	31,863
1950	18,456	27,530	45,986
1951	18,440	28,920	47,360
1952	20,300	31,810	52,110
1953	20,300	32,763	53,063
1954	21,500	36,100	57,600
1955	23,200	40,700	63,900

Since World War II the coal industry of Czechoslovakia has been expanded and modernized to meet the huge increase in industrial production. Accelerated industrial output placed severe demands on the coal industry, which could not achieve the planned goals in earlier years. In 1955, however, planned production for both bituminous and lignite was actually exceeded.

Since 1947 Czechoslovakia has completed four economic plans: The first (1947-48) was a 2-year plan; then followed the 5-year plan, ending in 1953; thereafter, there were two 1-year plans and the current 5-year plan for 1956-60, bringing Czechoslovakia on a program schedule like that of the Soviet Union and most of the other Eastern Bloc States. At the end of the current plan bituminous-coal production is to be 29.3 million metric tons and lignite 57.8 million tons.

In spite of the expected rise in production, bituminous coal is in short supply in Czechoslovakia, and the planned output for 1956 was about 200,000 tons short of scheduled production in October. Shortage of workers, absenteeism, and low productivity are the principal causes for the shortage. Increased industrial demands have been running ahead of coal-production growth; and, with an estimated coke production of 6.2 million tons in 1955 while only 3.0 million tons of pig iron was produced, it appears that considerable amounts of coke were exported to other Eastern Bloc countries, doubtless because of integrated plans and agreements that are likely to continue. Persistent reports of coal shortages point up the difficult straits in which the Czechoslovak coal industry finds itself.

Czechoslovakia has abundant coal resources. Through continued geological investigations, estimates of reserves are being increased, although overall data are only infrequently published. According to official Czechoslovak publications, measured and indicated reserves of the major coal and lignite deposits were given as follows: Brown coal or lignite, 11,193 million metric tons to a depth of 1,200 meters (3,936 feet); bituminous, 13,120 million tons to a depth of 1,500 meters (4,920 feet). Other estimates have been published; but, although the figures vary because of difference in the bases for calculation in all cases, calculations indicate that Czechoslovakia's bituminous and brown-coal reserves are more than adequate and are sufficient to last for centuries to come.

Data for coal and other solid-fuels exports to eastern Soviet Bloc countries are not available. Reports showing imports into Western European areas, however, reveal 1955 solid-fuels movements from Czechoslovakia to Austria and West Germany, in thousand metric tons, as follows:

<u>Country</u>	<u>Bituminous</u>	<u>Brown coal</u>	<u>Coke</u>	<u>Briquets</u>	<u>Total</u>
Austria	181	101	104	2	388
West Germany.	31	852	0	119	1,002

Germany (East)

Total coal production in the German Peoples' Republic in 1955 amounted to 203.1 million metric tons, of which about 200.0 million tons was brown coal or lignite and 3.1 million tons bituminous. More brown coal was produced in the German Peoples' Republic in 1955 than in any other country in the world.

Brown-coal reserves in the four large producing areas (Braunschweig-Magdeburg, Thuringia-Saxony, Lausitz, and the northern area's small deposits) are estimated at about 28.6 billion metric tons. About 14.5 billion tons of measured reserves is estimated as suitable for surface-mining (strip) and 5.2 billion tons for deep-mining methods. Reserves of bituminous coal are limited and amount to 225 million tons, a large part of which is not minable. Measured and indicated minable reserves of the Lugau and Ölsnitz districts, the principal sources of East Germany's bituminous-coal mining, are estimated at only 70 million tons. Mining conditions at most of the country's bituminous deposits are difficult and costly, and it would seem over-optimistic to expect any significant rise in bituminous production. The mining of submarginal coal in the regulated East German economy, however, is a possibility, although planned goals for bituminous production probably will be limited largely to improving existing installations.

The goal for coal production in the Second Five-Year Plan for the period 1956-60 has been set at 260 million metric tons and can doubtless be reached through intensifying efforts of the highly mechanized productive brown-coal surface mines, while smaller gains can be made in bituminous mines through modernization and expansion. No significant bituminous production, however, is to be expected.

In 1954 about 2.9 million metric tons of brown-coal briquets was exported to Western European countries (including estimated shipments to West Germany). Nearly 4.0 million tons of bituminous coal was imported during the same year, principally from Poland. Approximately 66.2 million tons of standard bituminous-coal equivalent was consumed in the German Peoples' Republic in 1954.

Hungary

The coal industry of Hungary, growing before World War II, has made unprecedented gains since the war. Coal production in 1955 amounted to some 22.3 million metric tons compared with 9.4 million tons in 1938 and 11.5 million tons in 1949. The total coal production, in thousand metric tons, for selected years, was as follows:

Year	Bituminous	Lignite		Total
		Higher grade	Lower grade	
1938	1,042	7,750	568	9,360
1950	1,400	10,837	1,031	13,268
1951	1,619	12,065	1,586	15,270
1952	1,718	14,616	2,230	18,564
1953	1,993	16,195	2,821	21,009
1954	2,435	16,024	3,077	21,536
1955	2,692	16,249	3,375	22,310

As in most southeast European countries, the largest part of the production was lignite. Work has been pushed to continue increased coal production to pace the accelerated industrialization program, which may become bogged down, should a dire coal shortage occur.

Productivity of underground workers in the coal industry, which reached a record 1.462 metric tons per man-shift in 1952, declined to 1.282 tons in 1955. Output per man-shift, in metric tons, since 1950 was as follows:

Year	Overall	Underground
1950	0.873	1.321
1951	.917	1.359
1952	1.000	1.462
1953	1.002	1.419
1954	.912	1.281
1955	.926	1.282

The gains in Hungarian coal production after the war can be attributed to increased mechanization and the development of new mining operations. Most of the mining machinery during the earlier post-World War II years was obtained from the U.S.S.R., but Hungary has since developed a sizable mining-machine industry of its own.

Because of the stress on the coal-mining industry in the Five-Year Economic Plans, geological investigations undertaken in many areas have resulted in new coal discoveries, some of which account for the significant production at the present time. Older reserve estimates were revised; and, according to recent reports, Hungarian coal reserves (measured, indicated, and inferred) are estimated, in million metric tons, as follows:

Bituminous	113
Bituminous coking coal	20
Lignite (high and low grade)	<u>1,600</u>
Total	1,733

Geological research during the Five-Year Plan for 1956-60 is to be continued on a large scale. Measured (proved) coal reserves are expected to reach 330 million metric tons.

According to recent reports relating to the effects of the prolonged Hungarian uprising, the 1957 coal production was forecast at about 14 million tons or 58 percent of the 24 million-ton goal. It is estimated that approximately half of the mine-labor force of about 84,000 has been lost. Although shutdowns throughout industry have reduced requirements to a large extent, the Hungarian Government plans to import about 3.5 million tons of coal during 1957. Shipments from the U.S.S.R.

have already been arriving in volume, and by March 1957 a total of about 700,000 tons is expected to be reached. Because of the unexpected coal deficit in the Hungarian economy, coal imports from western countries also may be anticipated.

In spite of the coal-production increases before the uprising in 1956, there have been persistent reports of coal shortages. Accelerated industrial demands steadily outpaced the rising production. The completion in 1956 of new 800,000-ton-coal-input-capacity coking plant, which was to use indigenous coking coals, was expected to yield only a part of Hungarian coke requirements. Imports of coke, which were running at about 550,000 tons annually in 1955 and 1956, were expected to increase to 750,000 tons in spite of the new plant construction. The planned coal production goal of 29.4 million tons in 1960 would still have left Hungary short of coal because of the growing industrial requirements, particularly for higher quality foreign coals. Under the existing Five-Year Plan, which will doubtless be revised because of the uprising, Hungarian coal-production-plan goals were as follows, in thousand metric tons:

Bituminous	5,400
Lignite (higher grade) ..	19,500
Lignite (lower grade) ...	<u>4,500</u>
Total	29,400

Poland

Poland has set a coal-production target for 100 million metric tons in 1956 (94.5 million tons produced in 1955). At the close of the first half of 1956, however, the rate of production was about 2.5 million tons short of the midyear goal. The decline reportedly is caused by lagging productivity (average, 1.3 metric tons per man-shift overall in 1954) possibly related to mine-labor unrest resulting from economic and political disturbances. Certain mine-wage increases and other incentives to labor have been established to improve productivity, but full accomplishment of the 1956 target is now only problematical. In 1956 persistent reports of a shortage of coal for internal consumption gave rise to further indications of difficulties being encountered in the industry. Information has been made public indicating that the current shortages in Poland's supplies will require a large reduction in exports to the Western European countries.

At the end of World War II Poland became the second largest exporter of bituminous coal in the world, following the United States, and the foremost in Europe. This strong position in the international coal trade is principally the result of the acquisition of the Upper and Lower Silesian coalfields, formerly part of Germany, which has enabled Poland to more than double its pre-World War II production. Great Britain and West Germany were the two largest prewar II European exporters.

In the period between the two World Wars, Poland's coal exports averaged almost one-third of total production, the bulk of which went to Western Europe, including Scandinavian countries. Since Poland came under Soviet control, coal exports have continued at a high level and amounted to about 25.6 percent of the 1955 production. The current distribution trend of Poland's export trade, however, reflects a complete reversal of prewar II movements. In 1955 approximately 65 percent of total coal exports was destined to the U.S.S.R. and other Soviet Bloc countries, while Western European areas received only about 28 percent, all of steam and gas grades. The remaining exports moved to Argentina (873,000 metric tons) and to other unidentified areas.

In 1955 Poland exported slightly over 27 million metric tons of coal, more than twice the pre-World War II levels but considerably below the 1937 exports of other leading exporting countries. Coal exports from Poland and other major exporting countries for selected years, in thousand metric tons, are shown in the following table:

Year	Poland	Great Britain	Germany	United States
1937	11,278	40,388	38,168	13,660
1950	25,688	13,769	15,378	26,635
1954	24,235	16,476	16,113	30,746
1955	24,146	14,495	12,552	49,345

Polish exports of coal and coke to individual countries in 1955, in thousand metric tons, follow:

	Coal	Coke
Soviet Bloc:		
Czechoslovakia	3,690	-
East Germany	3,801	1,059
Hungary	-	334
Rumania	-	236
U.S.S.R.	8,210	435
Total	15,701	2,064
Free World:		
Argentina	873	-
Austria	1,137	30
Denmark	513	-
Finland	1,511	1
France	439	-
Greece	1	-
Italy	108	-
Norway	6	-
Portugal	6	-
Sweden	889	-
Switzerland	34	-
United Kingdom	1,382	-
West Germany	713	51
Yugoslavia	52	-
Total	7,664	82
Unidentified	781	94
Grand total	24,146	2,240

Coal consumption in Poland was estimated at 70 million tons in 1955. Full demands were not met, however, and shortages in supply were indicated in unofficial reporting. The need for coking coal is a growing problem in Poland, where home supplies are limited. In late 1956 Polish trade officials indicated that Poland was anxious to immediately purchase United States coking coal to the extent of 80,000-100,000 metric tons and to negotiate for future supplies amounting to 500,000 tons annually. This is indicative of the serious supply situation that has developed in the Polish fuel economy. It is known, however, that Poland's current foreign-exchange position is unfavorable, and dollar reserves are not available for purchase of large quantities of United States coal.

Rumania

Rumania's coal resources, like those of most other Balkan countries, are comprised of relatively large lignite reserves (higher and lower grade) and small quantities of anthracite and bituminous coals. The anthracite and bituminous deposits are in the southwestern part of the country. Anthracite is mined only in one locality and is of only minor importance in the country's coal industry. Bituminous-coal deposits are in the Banat near the Yugoslav frontier, the source of most of Rumania's coking coal. The most significant lignite-mining operations are in the Jiul Valley near Petroseni, where it is reported that, among the higher grade lignites, there are some grades of subbituminous coking coal, which has been Rumania's chief coal deficiency over the years.

Although geological investigations of coal deposits are still presumably in process, reported coal reserves, in million tons, are as follows:

Anthracite and bituminous	48
Bituminous coking coal	10
Lignite (higher and lower grade)	2,800-3,500

Until after World War II, development of Rumanian coal deposits was retarded because of the availability and usually lower price of other fuels, largely petroleum products from the country's large oil industry. Since the war, emphasis has been placed on utilization of local lower grade fuels, and coal production rose rapidly. Coal-production estimates, in million metric tons, for selected years were reported as follows:

Year	Anthracite and bituminous	Lignite	Total
1938	0.3	2.1	2.4
1950	.3	3.6	3.9
1951	.3	4.3	4.6
1952	.4	4.8	5.2
1953	.4	5.0	5.4
1954	.4	5.1	5.5
1955	.5	5.7	6.2

The foregoing data make it evident that the most significant gains have been in the comparatively underdeveloped lignite production. Even with the spectacular production rise of lignite, as compared with pre-World War II levels, however, total production fell short of the optimistic goal of 8.5 million metric tons for 1955. The reasons for the failure to achieve planned goals, judging from press reports, appear to be the lack of widespread application of mechanization, shortage of trained miners and technicians, and failure to fully utilize available machinery and equipment.

Failure to achieve the 1955 plan goal, however, has not dampened the enthusiasm of the Government planners who set the 1960 Plan goal at a towering 11.8 million tons.

Soviet Union

The U.S.S.R.'s fuel requirements in 1955 exceeded the available indigenous supply, which was supplemented by imports of coal and oil. The production of primary energy in 1955 was estimated at about 510 million metric tons in standard coal

equivalent, of which coal accounted for 54.2 percent; lignite, 7.5 percent; peat, 5 percent; and fuelwood, 9.8 percent. The remainder was supplied by petroleum (18.1 percent), natural gas (2.7 percent), and hydroelectric power (2.7 percent).

Notwithstanding the large increases in coal production in the U.S.S.R., the Soviet Union remains a net importer of coal. Although exact data on coal imports from all sources in physical units are not available, it was officially reported that, of the 15.7 million metric tons of coal exported from Poland to the Soviet Bloc areas in 1955, 8.2 million tons was destined for consumption in the U.S.S.R. Persistent reports of Polish coal shortages and efforts toward greater coal saving in internal consumption, with the known quantities exported to western countries, confirm reports of the relatively high export level and indicate that the large volume of coal imported by the Soviet Union from Poland each year since 1947 has been maintained.

According to statistics of the United Nations Economic Commission for Europe, in 1955 the U.S.S.R. exported 1.3 million metric tons of coal, mostly anthracite from the Donets Basin, and 133,000 tons of coke to Western European countries. Additional coal exports are made to satellite countries; and, although the quantities are not known, it is not believed that they are significant enough to compare with U.S.S.R. imports.

Total coal production in the U.S.S.R. in 1955 was 391 million metric tons, of which 208 million tons was bituminous, 68 million tons anthracite, and 115 million tons lignite. As in previous years, most of the production originated in the western areas of the Union, although the established trend toward decentralization and development of the newer coalfields in the northern and eastern areas continued its uninterrupted rise.

Although there was an approximate gain of 50 percent in the total coal output in 1955 compared with 1950, the greater proportion of the northern and eastern coalfields reduced considerably the traditional paramount position of the Donets and Moscow Basins. Continued expansion in all sectors of the economy under the Sixth Five-Year Plan will increase coal demand to unprecedented heights. To meet these demands an annual coal-production rate of 593 million metric tons is scheduled to be attained by 1960. The achievement of this goal appears to be within the realm of possibility for the Soviet Union, which can, through direction of all the country's resources, devote large capital investments for application in new mine development, construction, mechanization, research, and education. Although increased mechanization and improved methods can raise production in most of the older mines, particularly in the Donets Basin, the bulk of the new production increase will come from new mines and stripping (open-pit) operations east of the Urals. In 1955, 64.7 million metric tons, or about 17 percent of the total production, was produced by strip mining. In 1960, 124.5 million tons, or 21 percent of planned production will be strip-mined.

In 1955 overall productivity in deep mining was 32.5 metric tons per man per month, and in strip mining it was 177.2 tons. Output per man-shift (underground and strip mines) was reported at 1.67 tons and is comparable to that of the highest Western European countries.

STATISTICAL ANNEX

TABLE 1. - Recoverable coal reserves of selected countries, Europe

(Billion metric tons)		
Country	Bituminous and anthracite	Other coals (lignites and higher grade lignites)
Federal Republic of Germany	67.2	63.0
East Germany ^{1/}	0.2	28.6
Saar	2.8	-
France	5.7	.3
Belgium	2.8	-
Netherlands	5.0	.0
Italy	.5	.8
United Kingdom	48.7	-
Turkey	1.0	.3
Norway (Spitsbergen)	2.5	-
Portugal	.0	-
Sweden	.1	-
Austria	.0	.2
Denmark	-	.0
Greece	-	.0
Spain	6.3	1.5
Hungary	.0	1.6
Yugoslavia	.1	12.0
Rumania	1.7	1.1
Bulgaria	.1	1.4
Poland ^{2/}	71.0	1.0
Czechoslovakia	.1	12.0
U.S.S.R. ^{3/}	425.6	-
Total	641.4	123.8
Total western countries	142.6	66.1
Total eastern countries	498.8	57.7

^{1/} Reported total reserves.^{2/} Includes Czechoslovakia portion of Ostrava and Upper Silesian Basin coals.^{3/} Includes other coals.

NOTE: Data relate to 1950-52.

COMMENT: Most coal-reserve data published are usually considered from a geological standpoint and include all coals to a depth of 1,500 meters or even 2,000 meters below the surface. The data in this table have been compiled from the various countries in recent years; and, because of the difference in reporting criteria, it cannot be readily determined how recoverability was determined or if such factors as depth, seam thickness, coal quality, local conditions, transport facilities, and other problems limiting recoverability were considered. In spite of these unknown factors for many countries, the data for the more advanced historically important coal countries appear to be adequate for the recoverable coal-reserve estimates as shown.

Source: Glückauf, Essen.

TABLE 2. - Coal production in selected countries, Europe, 1950,
1955, and 9 months in 1956^{1/}

(Thousand metric tons)			
Country	1950	1955	January-September 1956
Austria	177	173	130
Belgium	27,321	29,978	21,932
France	50,835	55,336	40,764
Germany (West)	112,317	132,545	100,442
Italy	1,028	1,134	779
Netherlands	12,247	11,893	8,842
Norway (Spitsbergen)	375	300	225
Portugal	419	406	305
Saar	15,091	17,330	12,867
Spain	11,042	12,359	9,400
United Kingdom	219,796	225,152	166,341
Yugoslavia	1,154	1,137	897
Total (Free Europe)	451,802	487,743	362,924
Bulgaria	270	600	450
Czechoslovakia	18,500	23,200	16,800
Germany (East)	2,800	3,100	2,260
Hungary	1,400	2,700	1,950
Poland	78,001	94,500	71,500
Rumania	300	500	380
U.S.S.R.	205,000	276,100	215,500
Total (Soviet Bloc)	306,271	400,700	308,840
Grand total	758,073	888,443	671,764

^{1/} Bituminous and anthracite, excluding lignite and brown coal.

^{2/} Preliminary.

Source: Economic Commission for Europe; Federal Bureau of Mines.

TABLE 3. - Productivity in the European coal-mining industries of selected
countries, overall output per man-shift (OMS)

(Metric tons)					
Country	1938	1950	1953	1954	1955
Belgium	0.753	0.693	0.766	0.784	0.825
Czechoslovakia	1.116	1.200	N.a.	N.a.	N.a.
France	.825	.768	.926	.988	1.042
Germany (West)	1.500	1.063	1.104	1.126	1.163
Hungary	N.a.	.873	1.002	.912	.926
Netherlands	1.588	1.112	.986	.967	.953
Poland	^{1/} 1.738	-	1.308	1.288	N.a.
Saar	1.176	.960	1.082	1.119	1.157
United Kingdom	1.158	1.211	1.239	1.250	1.245
U.S.S.R.	N.a.	N.a.	N.a.	N.a.	^{2/} 1.670

^{1/} 1937.

^{2/} Includes strip mines.

N.a. Not available.

Source: Economic Commission for Europe; Polish Statistical Yearbook; UGOL, U.S.S.R.

TABLE 4. - Coal imports by selected European countries, 1955^{1/}

(Thousand metric tons)						
Country of origin	Importing countries					
	Austria	Belgium-Luxembourg	Denmark	France	Finland	Germany (West)
Belgium	-	-	21	1,510	49	1,022
Canada	-	-	-	-	-	-
Czechoslovakia	188	-	-	-	-	31
France	-	633	2/ 399	-	59	1,275
French North Africa ...	-	10	-	85	-	-
Germany (West)	1,101	1,404	213	2,784	-	-
Netherlands	-	372	-	342	47	370
Poland	1,159	-	513	438	1,472	714
Saar	343	71	3/	3,692	-	4,049
Union of South Africa..	-	-	-	18	-	-
U.S.S.R.	-	124	-	550	207	-
United Kingdom	-	486	3,652	950	136	1,339
United States	1,305	783	286	802	150	6,998
Other	33	50	29	58	-	191
Total	4,129	3,933	5,113	11,229	2,120	15,989
Country of origin	Greece	Ireland	Italy	Netherlands	Norway ^{4/}	Portugal
Belgium	-	-	198	3,019	25	-
Canada	-	-	-	-	-	-
Czechoslovakia	-	-	-	-	-	-
France	-	-	284	132	-	2
French North Africa ...	-	-	39	-	-	6
Germany (West)	50	-	2,913	2,580	19	38
Netherlands	-	-	-	-	14	-
Poland	1	-	108	-	6	6
Saar	-	-	174	-	-	-
Union of South Africa..	-	-	18	-	-	-
U.S.S.R.	32	-	207	128	-	-
United Kingdom	66	1,692	804	748	239	354
United States	158	61	5,635	1,482	412	70
Other	-	-	35	5	-	14
Total	307	1,753	10,415	8,094	715	490
Country of origin	Saar	Spain ^{5/}	Sweden	Switzerland	United Kingdom	Yugoslavia
Belgium	-	8	38	134	1,574	-
Canada	-	-	-	-	159	-
Czechoslovakia	-	-	-	-	-	-
France	203	40	-	550	2,774	-
French North Africa ...	-	-	-	-	-	-
Germany (West)	820	44	373	566	200	27
Netherlands	-	17	-	107	-	-
Poland	-	-	875	34	1,382	52
Saar	-	-	240	442	-	-
Union of South Africa..	-	-	-	-	-	-
U.S.S.R.	-	-	97	5	-	125
United Kingdom	-	90	999	20	-	-
United States	-	440	568	11	5,454	763
Other	-	42	20	-	5	37
Total	1,023	681	3,210	1,869	11,548	1,004

1/ Includes patent fuel (bituminous-coal briquets). 2/ Includes coal from the Saar. 3/ Saar coal included with France. 4/ Excludes Spitsbergen coal.

5/ Includes some coke and lignite.

Source: Economic Commission for Europe (ECE).

TABLE 5. - Imports of solid fuels by type and country of origin, Italy, 1955

(Thousand metric tons)

Country of origin	Anthracite	Coking coal	Gas coal	Steam coal	Coke	Briquets	Total solid fuels
Belgium	35	1	70	94	-	-	200
France	6	-	16	256	4	6	288
Germany (West)	132	1,027	503	1,184	34	134	3,014
Poland	-	-	4	102	-	-	106
Saar	-	-	68	104	-	2	174
Union of South Africa	19	-	-	-	-	-	19
United Kingdom	111	-	155	515	22	23	826
United States	119	2,951	1,706	856	-	-	5,632
U.S.S.R.	205	-	-	3	-	-	208
Other	43	1	-	31	8	17	100
Total	670	3,980	2,522	3,145	68	182	10,567

Source: Bolletino del Comitato Carboni Ministero dell' Industria e del Commercio, Rome, vol. 10, Nos. 1-3, January-February 1956.

TABLE 6. - United States bituminous-coal and anthracite exports to Europe, by countries of destination,
1938, 1947, 1950-55, and January-September 1956

Type of coal;	(Net tons)								1955 ^{1/}	Jan.-Sept. 1956 ^{1/}
Country of destination	1938	1947	1950	1951	1952	1953	1954			
Bituminous:										
Austria	-	122,391	-	929,356	720,804	67,069	421,543	809,807	1,040,437	
Belgium and Luxembourg	-	3,363,800	50,352	1,495,110	711,519	644,303	265,118	1,142,452	1,176,817	
Denmark	-	2,377,583	-	1,075,809	953,273	6,399	224,622	357,752	279,582	
Finland	-	637,271	48,107	191,218	204,693	-	9,284	188,772	147,301	
France	11,192	12,466,388	10,944	4,305,301	3,169,758	373,946	68,861	1,016,888	4,838,068	
Germany (West)	-	42,630	31,333	6,047,167	7,182,086	3,135,255	1,383,979	6,667,860	7,509,738	
Gibraltar	-	156,872	21,743	170,587	46,025	-	-	22,355	23,663	
Greece	-	34,056	-	-	-	-	30,849	151,934	95,342	
Iceland	-	-	-	4,865	-	-	-	6,417	7,180	
Ireland (Eire)	-	1,005,584	10,827	681,679	220,228	3,980	-	-	-	
Italy	-	8,780,259	114,578	5,085,519	3,158,088	1,884,241	3,542,830	6,056,130	5,440,457	
Netherlands ^{2/}	-	2,691,248	33,629	3,368,526	2,077,716	1,238,026	1,944,583	4,623,496	4,844,800	
Norway	-	738,735	5,643	991,523	173,480	99,980	206,827	459,956	338,363	
Portugal	-	853,867	26,378	139,286	27,265	10,336	41,849	76,317	165,093	
Spain	-	-	-	14,800	209,164	46,417	275,236	433,096	214,539	
Sweden	-	2,074,092	140,882	942,039	798,476	53,479	429,676	656,223	688,456	
Switzerland	-	683,400	195,975	1,062,053	647,952	196,152	194,186	58,552	218,457	
Trieste	-	3/	-	118,395	49,027	105,767	242,511	378,709	358,420	
United Kingdom	-	675,043	103,579	1,302,260	216,366	-	461,091	4,868,839	2,316,056	
Yugoslavia	-	-	-	-	106,301	446,270	728,193	690,284	490,560	
Total	11,192	36,703,219	793,970	27,925,493	20,672,221	8,311,620	10,471,238	28,665,839	30,193,329	
Anthracite:										
Austria	-	-	-	32,516	10,496	-	-	-	-	
Belgium and Luxembourg	-	1,367,636	20,744	226,780	10,159	-	-	-	122,017	
Denmark	-	40,550	-	1,946	-	-	-	2,843	-	
Finland	-	-	-	-	-	-	-	-	10,905	
France	8	1,404,785	50,614	1,333,798	486,139	-	22,068	119,164	571,177	
Germany (West)	-	-	-	14	-	-	5,261	18,081	69,987	
Greece	-	-	-	-	-	12,288	34,273	-	25,257	
Ireland (Eire)	-	9,191	-	6,666	-	-	-	-	-	
Italy	-	157,945	-	45,302	10,867	-	78,015	150,511	105,217	
Netherlands ^{2/}	-	41,907	-	490,545	339,704	-	151,382	300,696	672,371	
Norway	-	201,135	-	190,269	-	18	-	15	10,713	
Portugal	-	2,464	-	-	-	-	-	-	-	
Sweden	-	577,999	-	-	1,670	-	-	-	-	
Switzerland	-	114,851	-	84,553	63,598	-	-	-	-	
Yugoslavia	-	-	10,572	10,618	922,633	39,830	29,512	-	-	
Total	8	3,918,463	81,930	2,423,007	922,633	52,136	320,511	591,310	1,587,644	
Total bituminous and anthracite	11,200	40,621,682	875,900	30,348,500	21,594,854	8,363,756	10,791,749	29,257,149	31,780,973	

1/ Preliminary.

2/ Includes coal for transshipment to other European destinations.

Source: Bureau of Mines, International Coal Trade.

TABLE 7. - Coal (anthracite and bituminous) supply, availability, and consumption in Western European countries, 1955^{1/}

(Thousand metric tons)

	Austria	Bel- gium	Den- mark	Fin- land	France	Germany (West)	Italy	Luxem- bourg
Production	173	29,975	0	0	55,336	132,545	1,134	0
Imports	4,114	3,633	5,113	2,211	10,780	15,877	10,317	291
Exports	0	7,122	0	0	5,842	12,552	0	0
Available for consumption ^{2/}	4,287	26,486	5,113	2,211	60,274	135,870	11,451	291
Consumption:	4,187	28,718	4,708	2,030	62,484	135,715	11,167	291
Coke manufacture	2,325	8,563	0	0	14,650	53,889	3,842	0
Electric powerplants	88	3,283	1,743	400	7,405	11,877	565	3/
Railways	774	1,310	369	390	4,172	9,709	1,488	69
Gas plants	98	16	776	120	2,332	6,723	1,430	49
Iron and steel industry..	18	283	0	0	1,642	2,097	233	22
Other major industries...	504	4,210	1,767	970	11,404	20,442	2,781	((151
Domestic and small industries	361	6,041	N.a.	90	8,442	7,310	738	(
Briquet manufacture	0	1,454	0	0	6,375	6,189	34	0
Internal navigation	0	8	53	0	58	1,444	0	0
Mine consumption	19	2,665	0	0	4,575	10,549	25	0
Issued to miners	N.a.	714	0	0	1,429	2,420	17	0
Other	0	171	N.a.	60	N.a.	3,066	24	0
	Nether- lands	Norway	Portugal	Saar	Spain ^{4/}	Sweden	United Kingdom	
Production	11,893	322	406	17,330	12,398	189	225,152	
Imports	7,606	715	484	1,022	974	3,210	11,548	
Exports	917	136	0	9,771	insig.	insig.	5/14,495	
Available for consumption ^{2/}	18,582	901	890	8,581	13,372	3,399	222,205	
Consumption:	18,388	931	846	9,139	13,133	2,925	219,509	
Coke manufacture	5,133	0	0	5,270	1,791	154	27,427	
Electric powerplants	4,248	0	61	874	1,670	301	44,729	
Railways	244	238	106	246	2,374	304	12,491	
Gas plants	1,182	95	80	0	396	902	28,355	
Iron and steel industry..	50	112	0	305	813	0	6,500	
Other major industries...	2,321	171	((459	186	2,922	423	39,847	
Domestic and small industries	3,093	211	(	331	1,371	686	33,421	
Briquet manufacture	955	0	88	0	1,031	0	1,676	
Internal navigation	N.a.	95	5/34	0	5/625	5/85	977	
Mine consumption	1,075	N.a.	8	1,560	N.a.	70	8,700	
Issued to miners	87	N.a.	0	367	N.a.	N.a.	5,229	
Other	0	9	10	0	140	0	10,157	

^{1/} Excludes lignite and brown coal but includes anthracite.

^{2/} Net availability for consumption (production, plus imports, minus exports) varies from actual consumption owing to annual variations in stocks at mines and in possession of consumers, coal in transit, and possible discrepancies in official reporting.

^{3/} Included with other industries.

^{4/} 1954 data.

^{5/} Includes bunker coal.

N.a. Not available.

Source: Economic Commission for Europe, United Nations.

TABLE 8. - Lignite (brown-coal) supply, availability, and consumption
in Western European countries, 1955

(Thousand metric tons)

	Austria	France	Germany (West)	Italy	Spain ^{1/}
Production	6,620	2,052	90,357	554	1,755
Imports	192	0	1,358	0	0
Exports	0	199	17	0	0
Available for consumption ^{2/}	6,812	1,853	91,698	554	1,755
Consumption:	6,777	1,892	91,662	627	1,724
Coke manufacture	0	0	1,739	0	0
Electric power plants	1,280	897	30,810	0	556
Railways	582	0	34	0	19
Gas plants	21	0	0	0	6
Iron and steel industry	656	0	143	0	0
Other major industries	2,647	803	8,731	449	925
Domestic and small industries	1,077	148	447	145	154
Briquet manufacture	0	0	34,452	0	8
Internal navigation	0	3	0	0	0
Mine consumption	426	25	15,293	13	0
Issued to miners	81	16	13	7	0
Other	7	0	0	13	56

^{1/} 1954 data.

^{2/} Net availability for consumption (production, plus imports, minus exports) varies from actual consumption owing to annual variations in stocks at mines and in possession of consumers, coal in transit, and possible discrepancies in official reporting.

Source: United Nations Economic Commission for Europe.

TABLE 9. - Trend of coal prices in principal European Coal and Steel Community countries,
for selected months, 1952-56

Type	Size	Year	(In U.S. dollars per metric ton, f.o.b. mine exclusive of taxes)					France		
			West Germany		Nether-lands	Belgium	Nord/P.d.C.I./Lorraine	Saar		
Anthracite	French nuts	Month	Ruhr	Aachen						
		1952 May	\$19.20	\$19.20	-	2/27.14	\$26.06	-	-	-
		1953 March	22.17	23.42	3/26.29	27.60	26.57	-	-	-
		1954 April	22.17	23.88	26.29	27.60	26.86	-	-	-
		1956 do.	23.08	25.83	29.89	4/ 30.00	27.83	-	-	-
Low-volatile bituminous.	Small nuts	1952 May	16.23	16.23	-	2/ 27.14	26.06	-	-	-
		1953 March	18.74	20.00	3/21.71	27.60	26.57	-	-	-
		1954 April	18.74	20.22	21.33	27.60	26.86	-	-	-
		1956 do.	19.66	22.28	23.81	4/ 30.00	27.26	-	-	-
Semibituminous	Singles	1952 May	11.65	-	-	2/ 17.22	19.66	-	-	-
		1953 March	13.03	-	3/14.48	16.40	18.69	-	-	-
		1954 April	13.03	13.71	14.48	16.40	18.69	-	-	-
		1956 do.	14.17	14.74	14.55	4/ 16.20	18.00	-	-	-
Bituminous	Washed duff or coking fines	1952 May	10.86	10.86	-	2/ 14.32	13.89	\$12.51	\$13.26	
		1953 March	12.00	13.25	3/13.84	14.20	14.40	16.63	13.54	
		1954 April	11.54	12.80	12.95	14.06	14.26	13.00	13.97	
		1956 do.	12.46	13.83	12.96	4/ 14.40	13.70	12.66	14.00	
High-volatile bituminous	Doubles	1952 May	11.31	-	-	2/ 18.22	17.43	17.71	18.29	
		1953 March	12.68	-	-	17.20	17.83	17.83	16.97	
		1954 April	12.45	-	-	17.20	17.69	17.83	18.86	
		1956 do.	13.37	-	-	4/ 16.26	17.69	17.83	18.86	
Coke	Large	1952 May	13.94	13.94	-	-	18.66	20.14	20.14	
		1953 March	14.63	15.88	2/16.63	-	18.80	20.29	20.29	
		1954 April	14.17	15.43	16.13	-	18.80	20.00	19.71	
		1956 do.	15.69	17.39	17.99	-	18.09	19.57	20.14	
Taxes to be added (percents)		1952	4.16	4.16	4.16	4.5	7.93	7.93	9.11	
		1953	4.16	4.16	4.16	4.5	7.93	7.93	9.11	
		1954	4.16	4.16	4.16	4.5	7.93	7.93	9.11	
		1956	4.16	5.3	4.16	5.0	11.11	11.11	9.11	

1/ Nord et Pas-de-Calais coalfield. 2/ June. 3/ April. 4/ May.

NOTE: Belgium - Effective October 1, 1956, prices of coal for household use increased approximately \$1.10 per metric ton, industrial coal \$1.50-\$1.80 per metric ton.

France - On May 1, 1956 prices of industrial metallurgical and foundry coke increased 250 Fr. francs. On May 16, 1956, metallurgical coke prices increased an additional 250 Fr. francs.

Lorraine coking fines prices also increased 250 francs.

Source: Statistical Bulletin - European Coal and Steel Community, Luxembourg, 1956.

TABLE 10. - Consumption^{1/} of primary energy, excluding bunker fuel,
in OEEC countries, 1955

(In thousand metric tons of coal equivalent)

Country	Solid fuels	Per- cent	Hydro- electricity	Per- cent	Petro- leum	Per- cent	Natural gas	Per- cent	Total
Austria	6,526	52	2,536	20	2,481	20	998	8	12,541
Belgium-Luxembourg.	31,930	84	39	2/	5,955	16	0	0	37,924
Denmark	6,831	62	130	1	4,125	37	0	0	11,086
France	81,185	70	10,412	9	23,675	21	378	2/	115,650
Germany (West)	148,152	88	4,720	3	15,278	9	319	2/	168,469
Greece	530	22	121	5	1,790	73	0	0	2,441
Iceland	50	11	155	33	266	56	0	0	471
Ireland	2,024	55	219	6	1,422	39	0	0	3,665
Italy	11,601	27	12,140	28	14,201	34	4,824	11	42,766
Netherlands	18,061	73	0	0	6,575	26	185	1	24,821
Norway	1,364	10	9,360	65	3,654	25	0	0	14,378
Portugal	891	30	669	23	1,379	47	0	0	2,939
Sweden	5,776	21	9,496	35	12,117	44	0	0	27,389
Switzerland	1,936	18	5,520	53	3,075	29	0	0	10,531
Turkey	4,215	70	36	2/	1,797	30	0	0	6,048
United Kingdom	220,231	87	880	2/	32,162	13	0	0	253,273
Total	541,303	74	56,433	7	129,952	18	6,704	1	734,392

1/ Consumption represents production plus imports, minus exports without regard to stocks.

2/ Less than 1/2 percent.

Note: Data not comparable in all cases with those shown in text owing to variations in reporting by different sources.

Source: Glückauf, Essen, Germany.

Conversion factors: 1,000 million kw.-hr. electricity = 0.4 million tons coal.

1 million tons lignite (brown coal) = 0.3 million tons coal.

1,000 million M³ natural gas = 1.33 million tons coal.

1 million tons petroleum = 1.5 million tons coal.